

HYDRO

**GRANDY BROOK STATION TO
HOPE BROOK STATION
TRANSMISSION LINE**

**ENVIRONMENTAL IMPACT
STATEMENT**

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ENVIRONMENTAL IMPACT

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NEWFOUNDLAND AND LABRADOR HYDRO

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NOVEMBER 1986

REVISED JANUARY 1987

EXECUTIVE SUMMARY

Newfoundland and Labrador Hydro (Hydro) proposes to construct a 138 kilovolt transmission facility to provide the power and energy requirements of the Hope Brook Gold Mine. The proposed transmission line route runs approximately 33 km in a southwesterly direction from Grandy Brook Station, which will be constructed adjacent to Route 480 approximately 23 km north of Burgeo, to a Station to be constructed at the Hope Brook Mine Site.

The proposed transmission line will be a standard wood pole H frame structure with three conductors. It will require a cleared right-of-way approximately 30 m wide, except in buffer areas such as stream crossings, where 3 m will be required. Access to the transmission line will be provided by an all terrain vehicle trail rather than a conventional access road.

Construction of the proposed facility will utilize conventional construction techniques. Material and workers will be transported to work sites along the transmission line primarily by tracked vehicles, although helicopters may also be used.

The proposed facility is to be in service by December 31, 1987. Construction of the transmission line and stations, which will require approximately 10 months to complete, is scheduled to commence in early February, 1987.

Following registration of the project under the Environmental Assessment Act (1980), concerns were expressed about possible adverse impacts on the following valued ecosystem components: terrestrial and aquatic habitat; water resources; resource utilization; wildlife; and historic resources. Consequently,

Hydro undertook component studies of historic resources and raptors (birds of prey) along the proposed route. These studies indicated that no significant adverse impacts should be expected on either of these resources as a result of the project.

Construction and operation of the proposed facility are not expected to result in significant adverse impacts on terrestrial and aquatic habitat, water resources and resource utilization. Comprehensive environmental protection measures, ranging from route selection to rehabilitation, have been developed and incorporated in a project specific environmental protection plan. Many of these measures have also been incorporated in contract clauses to ensure they will be implemented. Hydro will also institute a rigorous self-regulatory environmental compliance monitoring program in an effort to achieve the goal of minimum environmental impact.

Hydro has predicted that the proposed facility will not have a significant impact on either the population or movement patterns of the La Poile caribou herd. Measures have been included in the environmental protection plan to minimize any disturbance of the herd during construction and operation of the transmission line. Hydro has also committed to an environmental effects monitoring study to test the predictions regarding the potential impacts of the project on caribou.

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SECTION 1

INTRODUCTION

Newfoundland and Labrador Hydro (Hydro) proposes to construct and operate a transmission facility which will connect the town of Burgeo and the Hope Brook Gold Mine to the provincial electric grid. This undertaking consists of a 138 kilovolt (kV) transmission line to be constructed from the existing Bottom Brook Station to the Grandy Brook Station which will be constructed adjacent to Route 480 approximately 23 km north of Burgeo. From the latter station, a 138 kV transmission line will be constructed to the Mine and a 25 kV distribution line will be constructed to Burgeo.

Upon review of the registration under the Environmental Assessment Act (1980), the Minister of Environment required that Hydro prepare an environmental impact statement (EIS) for the transmission line between Grandy Brook Station and the Hope Brook Mine (TL 255). This EIS provides information on the proposed transmission line and the existing environment to facilitate an assessment of the environmental acceptability of the project. The potential impacts of the project on the existing environment are identified and mitigative measures are outlined. Residual impacts and environmental monitoring are also discussed.

The EIS focuses on several valued ecosystem components (Beanlands and Duinker 1983) which have been identified by Hydro, the public and government departments. Elements of the environment which have not been determined to be valued ecosystem components in this particular assessment are discussed only in sufficient detail to clarify the undertaking.

Hydro prepared one environmental protection plan for the transmission lines from Bottom Brook Station to Grandy Brook Station, Grandy Brook Station to Hope Brook Station, and Grandy Brook Station to Burgeo Station (Section 4.1). This was done because the lines are physically connected and are to be in service by December 31, 1987. The Bottom Brook Station to Grandy Brook Station and Grandy Brook Station to Burgeo Station lines were discharged by the Minister of Environment under the Environmental Assessment Act (1980). The Grandy Brook Station to Hope Brook Station transmission line cannot proceed, subject to other Acts or Regulations, until this EIS has been accepted as satisfactory by the Minister of Environment.

SECTION 2

PROJECT DESCRIPTION

2.1 THE PROPONENT

Hydro, a Provincial Crown Corporation, is the major supplier of electrical power and energy in the Province. On the Island of Newfoundland, Hydro owns and operates hydroelectric plants at Bay D'Espoir (580 megawatts), Hinds Lake (75 megawatts), Godaleich Pond (84 megawatts) and Cat Arm (127 megawatts). In addition, it operates an oil-fired generating station (450 megawatts) at Holyrood and three gas turbines (110 megawatts). In Labrador, Hydro is the majority owner of the Churchill Falls hydroelectric plant (5,400 megawatts). The Hydro Group maintains approximately 4,000 km of transmission lines on the Island and in Labrador.

The personnel responsible for preparation of this EIS are presented in Appendix I.

2.2 PROJECT RATIONALE

Hope Brook Gold Inc., a subsidiary of BP Canada (Selco Division), plans to construct and operate a gold mine in the Hope Brook area of the South Coast. Hydro was requested by BP Selco to supply the power and energy requirements of the Mine. These needs are estimated at 12 megawatts of power and 78,840 megawatthours of energy. The closest point of supply will be a station (Grandy Brook) on the Bottom Brook to Burgeo transmission facility. The cost of the proposed transmission line including the Hope Brook Station is approximately \$6,350,000.

The connection of this part of the south coast of Newfoundland to the provincial electric grid is economically feasible because of the combined demands of the Hope Brook Mine and the town of Burgeo. It would not be economic to connect only Burgeo or only the Mine to the grid.

2.3 PROJECT DESCRIPTION

2.3.1 Design Specifications

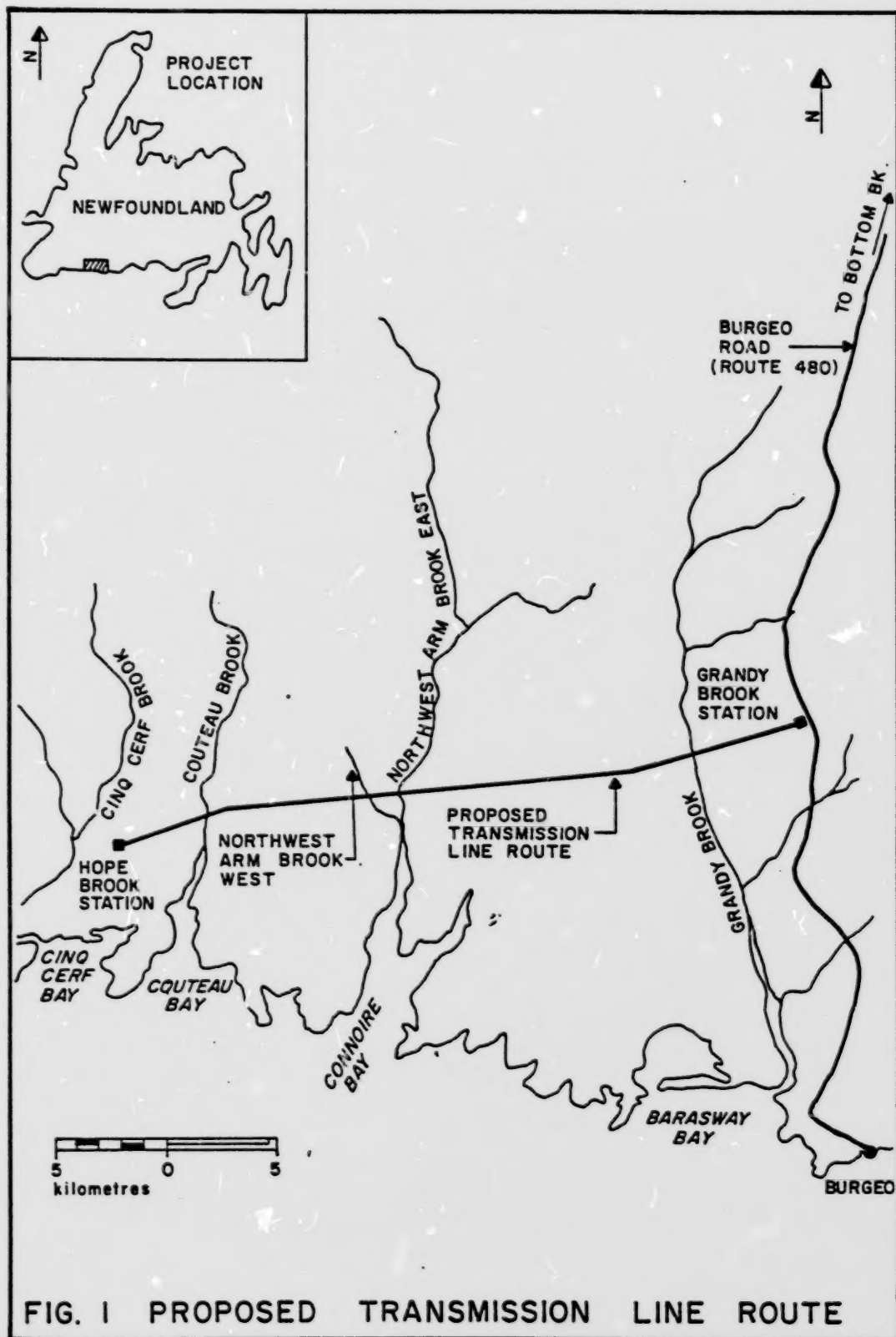
The proposed transmission line route is located in southwestern Newfoundland between Route 480 and Cinq Cerf Brook (Figure 1).

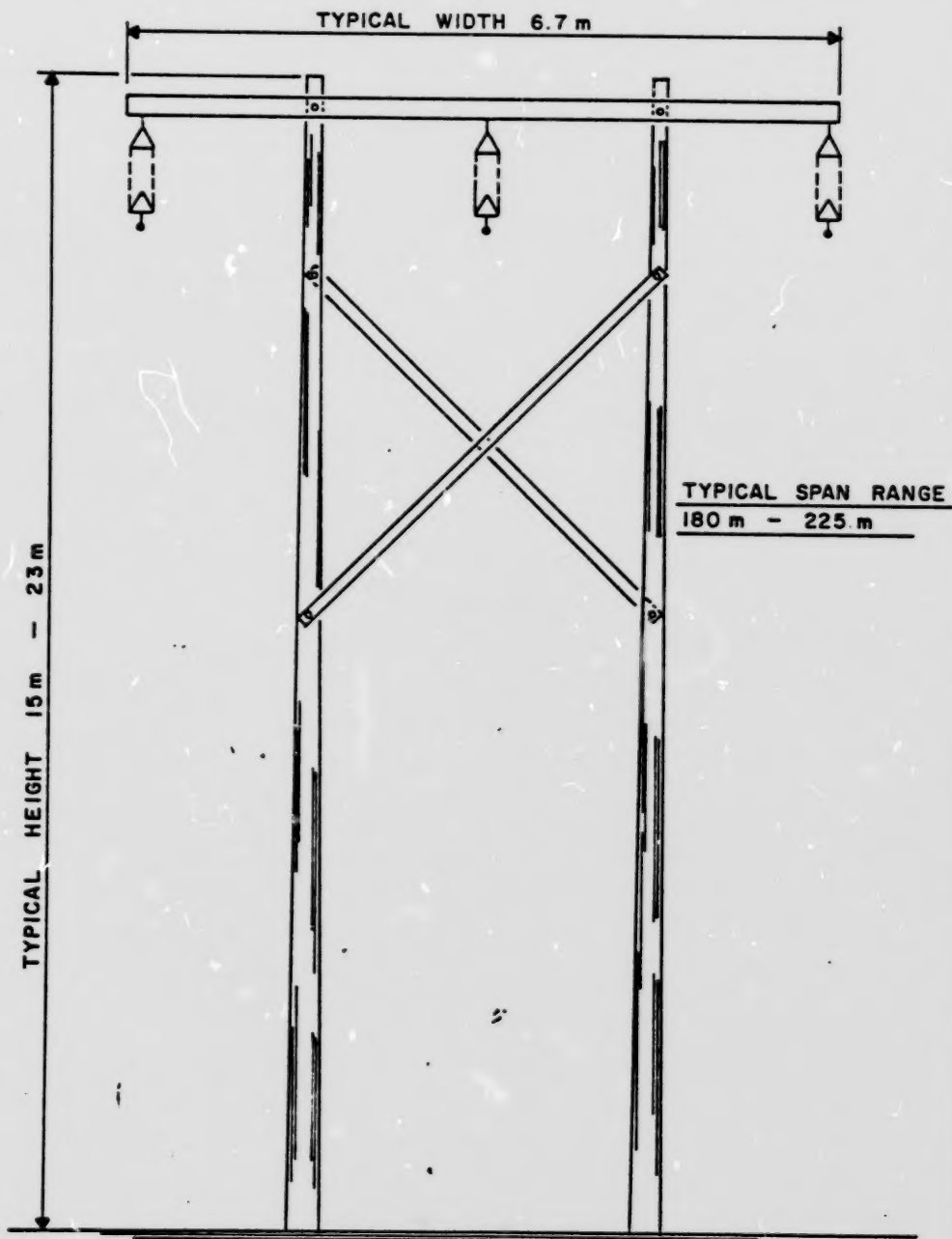
The proposed route runs in a southwesterly direction approximately 33 km between Grandy Brook Station which will be constructed adjacent to Route 480, approximately 23 km north of Burgeo, and a Station to be constructed at the Hope Brook Mine Site, approximately 4 km north of Cinq Cerf Bay.

The 138 KV transmission line will be a standard H frame structure (Figure 2) comprised of two treated wood poles between 15 and 23 m in height; one wood crossarm, about 6.7 m long, joined to the erect poles near the top; and two cross wood braces joined to the poles near the middle. Three insulator strings, spaced approximately 2 m apart along the crossarms will each support a 278.2 mm² Aluminum Alloy Stranded Conductor. The structures will be spaced between 180 m and 225 m apart.

The transmission line will require a cleared right-of-way approximately 30 m wide, except in buffer areas, as at stream crossings, where 3 m will be required.

Two stations will be constructed in association with this transmission line. Grandy Brook Station will contain the





TYPICAL TANGENT STRUCTURE
138 KV TRANSMISSION LINE

FIG. 2`

following major equipment: transformers, circuit breakers, disconnects, reclosers, regulators, a metering tank and associated buswork, hardware and grounding. Provision will be made for future extensions, such as the addition of a second transformer. The control building (1.6 m x 6.8 m) will accommodate a battery room and washroom facilities. The Hope Brook station, will consist of transformers, disconnects, and associated buswork hardware.

Access to the proposed transmission line will be an all terrain vehicle trail rather than a conventional access road. The access route, which is mainly within the 30 m wide right-of-way, has been selected to minimize terrain disturbance. The proposed route crosses twenty streams, all of which will be forded during construction and operational travel. Fording sites have been designated by Hydro for the major streams: Grandy Brook, both branches of Northwest Arm Brook and Couteau Brook.

2.3.2 Schedule

The proposed transmission line between Grandy Brook Station and Hope Brook Station is to be in service by December 31, 1987. Construction of the line, including the survey, will require approximately ten months. The treeless sections of the proposed route were surveyed in September and October, 1986. The survey of the remaining sections of the route, primarily stream valleys, and construction are scheduled to begin February 1, 1987, assuming that the requirements of the Environmental Assessment Act have been met by that date.

It is very difficult to provide a precise construction schedule because it will vary according to weather and terrain conditions and the contractor's progress on the Bottom Brook Station to Grandy Brook Station transmission

line which is being constructed concurrently. A provisional schedule is presented in Table 1.

This schedule assumes that it will be feasible to distribute poles under winter conditions, beginning in early February. If this proves to be unfeasible, distribution of material and subsequent construction activities will be delayed. Helicopters may be used to distribute material in some areas.

Stream crossings will occur between February 1 and October 31, 1987.

2.3.3 Construction

Preparation of the site and construction of the Grandy Brook Station will require the following equipment: 1 bulldozer, 1 backhoe, 1 frontend loader, 1 utility truck, 1 boom truck and 4 dump trucks. A work force of about 10 men will be required to construct the Station and an additional 10 men will be required to complete the mechanical and electrical work. No building will be required for the Hope Brook Station. About 10 men will be required to complete the mechanical and electrical work.

The contractor does not plan to establish a camp between Route 480 and the Mine. Work crews will probably be transported to and from work sites by tracked vehicles, such as Muskegs or Nodwells, although helicopters may also be used. Should travel time prove excessive, it may be necessary to establish a remote camp.

In this EIS, generic reference is made to a number of tracked vehicles. A "Muskeg" is a tracked vehicle approximately 3 m in length with a payload of about 2,700 kg. It is used to transport personnel and relatively light loads. A "Nodwell"

TABLE 1. PROVISIONAL CONSTRUCTION SCHEDULE*

Activity	Date
Survey of barren areas	September 8, 1986-October 15, 1986
Survey of treed areas	February 1-15, 1987
Staking of structure locations	February 1 - April 30, 1987
Clearing of line	February 1-28, 1987
Pole distribution	February 1 - April 30, 1987
Pole erection	February 8 - September 21, 1987
Framing	March 1 - September 30, 1987
Conductor stringing	April 1 - October 15, 1987
Construction of stations	May 15 - August 15, 1987
Installation of station equipment	August 15 - November 15, 1987
Commissioning	September 15 - December 31, 1987

* No work will be done between May 15 and June 15, 1987 between km 21 and the Hope Brook Mine in order to minimize any disturbance of caribou during the calving period.

is a larger vehicle, over 6 m in length with a payload of at least 3,000 kg, which is used to transport poles and heavy equipment.

Five major activities will be involved in the construction of the proposed transmission line:

- (1) material distribution;
- (2) pole erection;
- (3) structure framing;
- (4) conductor stringing; and
- (5) counterpoise installation

The manpower and equipment requirements of typical construction crews are presented in Table 2.

Material Distribution

The distribution of material and supplies, and the transportation of personnel will be continuous during construction of the line. These activities will primarily utilize tracked vehicles such as Nodwells, although helicopters and smaller all-terrain vehicles (ATV) such as "trikes" may also be used.

Prior to the initiation of pole erection, the contractor will mobilize one or more pole distribution crews. It is most likely that material will be distributed along the right-of-way from the Grandy Brook Station. Some material may be distributed from the Hope Brook Station. The boom truck will deliver poles as close to the right-of-way as possible. They will be transported to structure sites either by skidder or by Nodwell depending on the distance to the sites and terrain conditions.

Crews consisting of a Nodwell, an operator and a helper will

TABLE 2. MANPOWER AND EQUIPMENT COMPONENTS OF

TYPICAL CONSTRUCTION CREWS

ACTIVITY	MANPOWER	EQUIPMENT
Material Distribution	1-boom truck driver 2-vehicle operators 2-labourers	1-boom truck 1-skidder/ Nodwell 1-Muskeg 1-small ATV
Pole Erection	1-foreman 1-backhoe operator 1-Muskeg operator 2-labourers 1-blaster	1-backhoe (tracked) 1-Muskeg 1-rockdrill and compressor 1-pump
Structure Framing	1-foreman 2-linesmen 1-groundsman 1-vehicle operator	1-Muskeg 1-drill 1-generator
Conductor Stringing	2-foremen 4-linesmen 2-4-vehicle operators 2-groundsman 2-labourers	1-2-Nodwell(s) 1-2-Muskeg(s)
Counterpoise Installation	1-vehicle operator 2-labourers	1-bulldozer with plough 1-Muskeg

deliver framing components (crossarms, crossbraces and insulators) to each structure site. A similar operation will be used to place reels of conductor along the route. As with the poles, these materials may be distributed concurrently from both ends of the line, if water transport to the Hope Brook Mine is practical and economic in 1987.

Pole Erection

Following distribution of a sufficient number of poles to the structure sites to permit erection to progress efficiently, the contractor will mobilize the pole erection crews.

The backhoe will excavate the hole in earth. In rock, either the complete hole or a portion thereof will be drilled, blasted and excavated. The backhoe will then be used to erect the pole and to backfill the hole with previously excavated material. In areas of wet ground, it may be necessary to pump water from the hole, and if the excavated material is not suitable as backfill, imported fill will be used. Backfill material will be obtained as close as possible to the site. In areas of bog with depths greater than 600 mm, timber cribs will usually be constructed around each pole and backfilled with rock.

At a number of locations along the route, design considerations dictate that structures must be anchored and guyed. In earth, the anchors will consist of pressure treated logs up to 3.0 m in length which will be buried with a thimble-eye anchor rod extending from the log to above the ground surface. A guy wire will then be attached to this rod and to the pole to be anchored. The methods of excavation and backfilling will be similar to those described for the poles. In areas of rock, a thimble-eye anchor rod with an

expandable sleeve will be inserted into a drilled hole and grouted.

The number of pole erection crews will depend on the rate of progress. It is estimated that a maximum of three crews will be needed to meet the project schedule.

Structure Framing

When pole erection has progressed so as to permit uninterrupted work, the contractor will then mobilize a framing crew(s). The contractor will probably employ a minimum of two framing crews. One framing crew will complete an average of two or three structures per day.

Conductor Stringing

Stringing will begin as soon as enough structures have been framed to ensure that this operation will not be impeded. It will commence at the Grandy Brook Station and proceed toward the Hope Brook Mine Station. The three conductors at the first reel setup will be attached to the rear of a Nodwell and towed to a structure. The conductors will then be released from the Nodwell and the linesmen, with the aid of their groundsmen, will place each of the three conductors in individual "stringing blocks" which are attached to the bottom of the suspension insulators.

The conductors will then be re-attached to the Nodwell which will tow them to the next structure where this procedure is repeated. This procedure is repeated at each structure until all the conductor has been removed from the reels (approximately 2500 m). There will be a second setup of three reels of conductor at this point and the new conductors will be attached to the Nodwell and the procedures described previ-

ously will be repeated. A compression type joint will be used to join the conductor from successive reels.

Following the stringing of each setup, the conductor will be placed under tension, in what is termed "pre sag", for approximately 24 hours. It is then pulled to its permanent position and clamped into the insulator string.

Counterpoise Installation

Because of varying resistivity, counterpoise will be required to provide uniform grounding for the Stations and adjacent structures. The counterpoise is a #1 USSWG galvanized steel wire, 7 mm in diameter, which will be buried to a minimum depth of 300 mm. The counterpoise will be connected to metal fittings on each pole for a distance of 1.6 km from both Stations.

2.3.4 Operation and Maintenance

Maintenance of the transmission facility will consist of planned inspections, preventative maintenance and repair of damaged equipment. The line will be surveyed four times a year by helicopter. It will also be inspected on the ground by a crew annually, usually in the winter. The ground surveys will include a climbing inspection of approximately 20% of the structures. The ground surveys will utilize tracked vehicles or snowmobiles depending upon field conditions. A permanent line camp will not be required. Minor repairs may be done during the inspections; major repairs will be scheduled later.

Forced outages (e.g., broken poles or conductors) will require immediate attention. Such emergency repairs will be

performed using helicopters or tracked vehicles for access as required.

Vegetation control will be accomplished using hand-held equipment. Herbicides will not be used along the right-of-way.

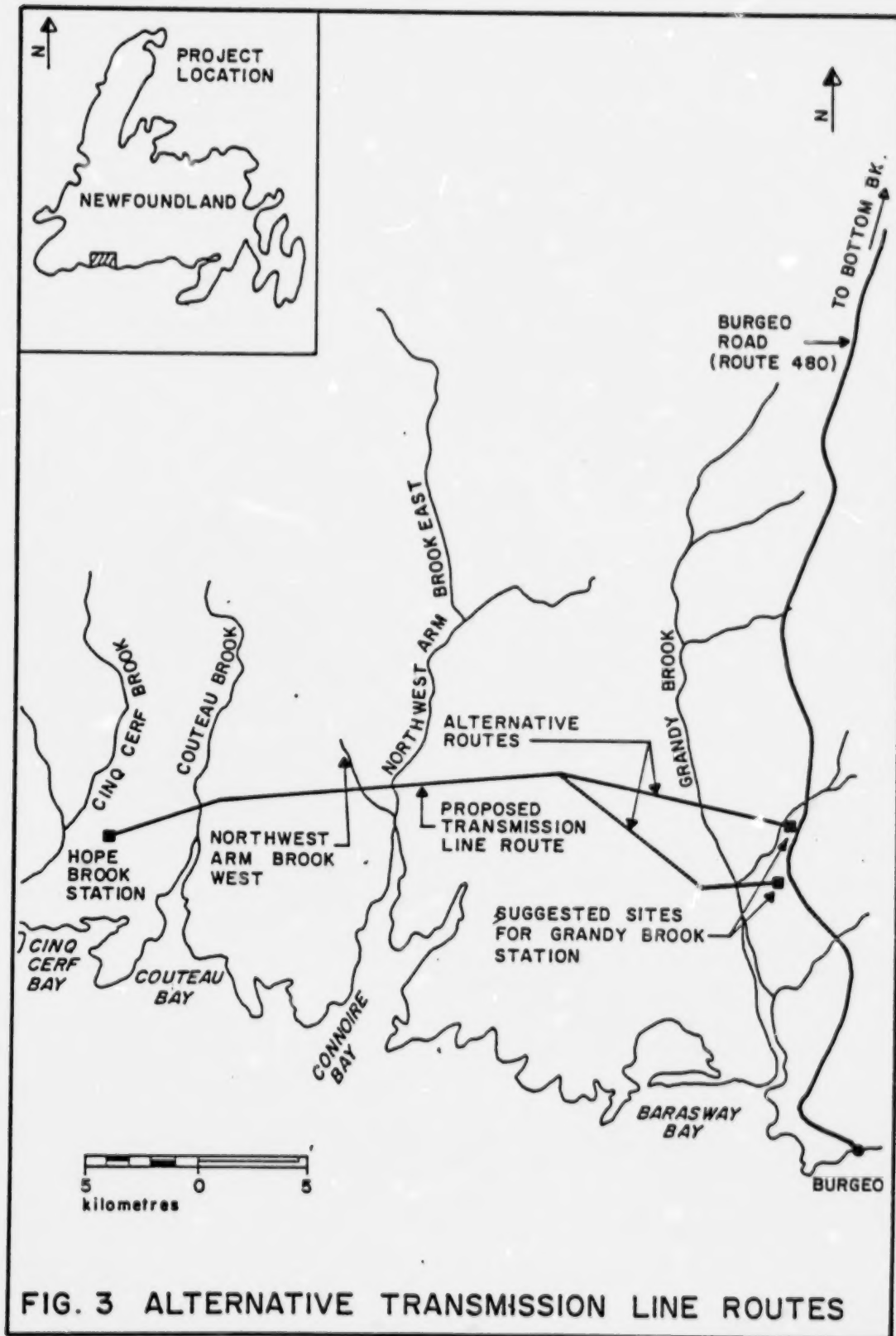
2.3.5 Abandonment

The life of the Hope Brook Mine is estimated to be 11 years (Hope Brook 1986). However, the recent decision to link the community of Grand Bruit to the provincial grid via a 7.5 kV distribution line from the Hope Brook Station requires that the proposed transmission line will be a permanent facility.

2.4 ALTERNATIVES

B.P. Selco investigated several alternative means of supplying the electrical needs of the Mine. It was determined that the optimum approach was to use electricity from the provincial grid. Therefore, Hydro was requested to build and operate a transmission line which would meet the requirements of the Mine. In terms of providing electricity to the Mine, Hydro has no alternative to constructing a transmission line. If it should be decided that the proposed transmission line cannot be constructed, B.P. Selco would have to provide electricity to the Mine by some other means (e.g., diesel generators).

Two alternative routes were examined for the first nine kilometres of the proposed transmission line west of Route 480 (Figure 3). These routes did not differ significantly in their potential impacts on valued ecosystem components. The northern alternative was preferred by Hydro because it



provided some topographical protection from onshore winds and icing. Further study resulted in the relocation of the Grandy Brook station approximately 5.5 km further north along Route 480 to its proposed site (Figure 1). This reduced the total cost of the project by maximizing the length of less expensive 25 kV line to Burgeo.

SECTION 3

ENVIRONMENTAL SETTING

The purpose of this section is to provide baseline information on the existing environment along the proposed route as it pertains to the following valued ecosystem components: terrestrial and aquatic habitat; water resources; the La Poile caribou (Rangifer tarandus) herd; raptors (birds of prey); and historic resources. Component studies, involving original research, were required to evaluate the status of raptors and historic resources along the proposed right-of-way. It was determined that, for assessment purposes, sufficient information was available to evaluate potential impacts of the development on the remaining valued ecosystem components.

3.1 BASELINE ENVIRONMENTAL CONDITIONS

3.1.1 Development Area

As described in Section 2.3, the proposed transmission line will require a cleared right-of-way approximately 30 m in width. Some potential impacts, such as those on terrestrial and aquatic habitat will essentially be confined to the right-of-way. In such cases, discussion is restricted to the area that may be affected. Other valued ecosystem components, such as certain species of wildlife and historic resources require evaluation over larger areas. These larger study areas are described in the appropriate sections below.

3.1.2 Terrestrial and Aquatic Habitat

Terrestrial Habitat

The proposed right-of-way lies within the Gander Tectonic Zone which consists of early Paleozoic sediments. These have been metamorphosed and intruded by numerous granite batholiths (Rogerson 1983). Geomorphologically, it is within the Lawrence Peneplain, a plain of low relative relief, formed after a long period of erosion and tectonic stability in the Mesozoic and Cenozoic (Rogerson 1983). High points within this peneplain are minor irregularities which may be formed by erosion resistant granites.

Mapping conducted by Bouzane (1986) and information provided by the Department of Mines and Energy indicated that the only potential sources of aggregate resources (i.e., borrow material) within a one kilometre wide corridor centered on the proposed right-of-way are located in stream beds (alluvial deposits), and in a craig and tail formation located approximately 2.5 km east of Grandy Brook. The proposed route will cross the northern extremity of the craig and tail formation which, according to Bouzane (1986), consists of sand and gravel over glacial till.

Bouzane (1986) found that most of the proposed route consists of a fen-barren complex with shallow fine textured till and bedrock at or near the surface. This terrain was judged to be moderately erodable because of the depth of the till and the close proximity of bedrock to the surface. Alluvial terraces along Grandy Brook are potentially very erodable but are stabilized by forest cover. Alluvial deposits in the beds of both branches of Northwest Arm Brook and Couteau Brook are very erodable and will be avoided whenever possible.

Damman (1983) classified the area traversed by the proposed transmission line as part of the South Coast Barrens subregion of the Maritime Barrens Ecoregion. It is characterized

by extensive barren areas consisting mainly of dwarf shrub heaths, shallow bogs, and fens. Forests are most common in the valleys. A combination of climatic and topographic effects results in a thin snow cover in this area which provides important wintering grounds for the La Poile caribou herd.

Aquatic Habitat

The proposed transmission line will cross one scheduled Atlantic salmon (Salmo salar) river (Grandy Brook), nineteen brooks and ten ponds. Unpublished data from the Department of Fisheries and Oceans (DFO) indicates that Couteau Brook contains 2,211 units (1 unit = 100 m²) of rearing habitat and 473 units of spawning habitat which are accessible to salmon. A falls creates a partial obstruction 2.8 km from the mouth, and another falls creates a complete obstruction to migration 7.4 km from the mouth. Similar mapping by DFO of Connoire Brook (Northwest Arm Brook), indicates that a falls creates a complete obstruction to salmon migration 0.8 km from the mouth and limits the amount of accessible rearing habitat to 45 units. No accessible spawning habitat was noted for Couteau Brook (Kanes pers. comm). DeGraaf (1981) identified spawning habitat and obstructions on the Grandy Brook system (Figure 4). No spawning habitat was identified in Grandy Brook within a one kilometre corridor centered on the proposed right-of-way.

The substrate at the Grandy Brook fording site is cobble (64-256 mm diameter) and boulder (256 mm diameter or greater). The banks have low relief, gentle slopes, and are covered by thick black spruce (Picea mariana) and balsam fir (Abies balsamea) dominated forest.

The proposed fording site on the east branch of Northwest Arm

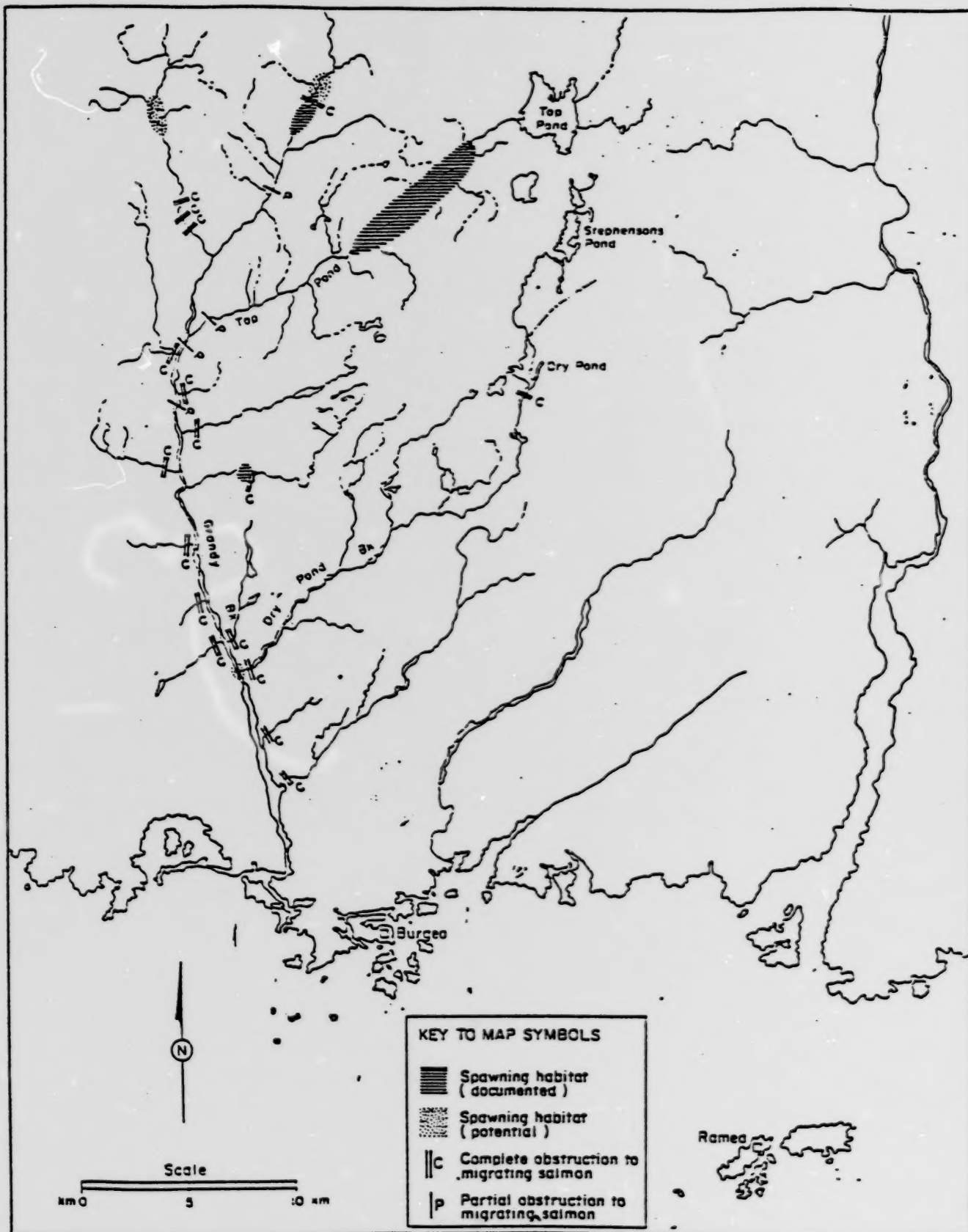


FIGURE 4. SPAWNING HABITAT AND OBSTRUCTIONS IN THE GRANDY BROOK SYSTEM (FROM DEGRAAF 1981)

Brook has a bedrock substrate, and low banks with gentle slopes. A thick cover of black spruce and balsam fir is present on the river bank.

The proposed fording site on the west branch of Northwest Arm Brook has a cobble and boulder substrate, and low banks with gentle slopes. A thick cover of black spruce and balsam fir is present on the river bank.

The proposed fording site on Couteau Brook has a cobble and boulder substrate, and low banks with gentle slopes. A thick cover of black spruce and balsam fir is present on the river bank.

3.1.3 Water Resources

The proposed transmission line crosses four major streams: Grandy Brook, Northwest Arm Brook East, Northwest Arm Brook West and Couteau Brook. The only stream flow record for these streams is from a station located on the lower part of Grandy Brook (1982 to present).

For the purposes of this assessment, the one in two year flood flows and mean velocities (Table 3) have been estimated for the above streams [Environment Canada and the Newfoundland Department of Environment (1984), and ShawMont (in prep)]. The mean velocities were estimated using information from maps and photographs. However, comparison of substrate at the proposed fording sites with transport velocities for various sizes of streambed materials (Fishes and Oceans and LGL 1983) suggests that these are valid estimates.

3.1.4 Wildlife Resources

TABLE 3. ESTIMATED ONE IN TWO YEAR FLOOD
(Q₂) AND MEAN VELOCITY (V_M) FOR
THE FOUR MAJOR STREAMS CROSSED
BY THE TRANSMISSION LINE

	GRANDY BROOK	NORTHWEST ARM BROOK EAST	NORTHWEST ARM BROOK WEST	COUTEAU BROOK
Drainage Area (km ²)	395	232	66	122
Mean Annual Runoff (mm)	1700	1700	1500	1600
Area Controlled by Lakes and Swamps (%)	20	20	75	25
One in Two Year Flood Flow (m ³ /s)	600	450	55	220
Estimated Mean Velocity (m/s)	0.4	0.45	0.25	0.25

Raptors

A raptor survey was conducted on July 12, 1986 as a component study of this EIS. (Fudge, Lane and Associates 1987). The study area consisted of a corridor 500 m in width on either side of the proposed center line, except within the valleys of Grandy, both branches of Northwest Arm and Couteau Brooks where the corridor was two kilometres wide. The entire area was surveyed by helicopter and approximately 15% of the proposed line was surveyed on foot.

A total of five raptors of three different species was recorded: one bald eagle (Haliaeetus leucocephalus); three rough-legged hawks (Buteo lagopus); and one merlin (Falco columbarius). All were observed flying through the area. The study area appeared to provide hunting area for the raptor species recorded. No nests were found.

Raptor densities were considered low. It was concluded that the study area offered no unique or special habitat features that might attract raptors for nesting (Fudge, Lane and Associates 1987).

Caribou

The transmission line will be located within the range of the La Poile caribou herd, the largest herd in insular Newfoundland. The La Poile herd was estimated at 9,300 ($\pm$ 2,702, 95% confidence limits) individuals in the early 1980's (Mercer et al. 1985). However, a more recent census by the Newfoundland Wildlife Division in February, 1986 estimated the LaPoile herd at 8,576 (+822/-754, 95% confidence limits) (Mahoney pers. comm.). Classification surveys carried out by the Newfoundland Wildlife Division between October 1985 and April 1986 indicated that the average composition of the La

Poile herd during that period was: stags - 18%; does - 59%; and calves or short yearlings - 23% (Mahoney pers. comm.). Until 1985, the range of the La Poile herd was believed to be as shown in Figure 5 (Northland Associates 1982). The caribou wintered along the South Coast from west of La Poile Bay to as far east as the White Bear River, and calved in the vicinity of Rocky Ridge Pond. The summer range was believed to be west and north of Rocky Ridge Pond.

Recent surveys conducted by the Wildlife Division in cooperation with B.P. Selco indicated that part of the La Poile herd calves in the vicinity of the proposed Hope Brook Mine (Northland Associates 1986). These surveys also indicated that some members of the herd winter east of the White Bear River.

In summary, the proposed transmission line will traverse areas used by the La Poile herd as winter, calving and post calving range.

3.1.5 Historic Resources

An historic resources overview assessment was undertaken by Penney (1986) as a component study of this EIS. No evidence of prehistoric occupation was found along the proposed transmission line route. The remains of telegraph pole placements found between both arms of Northwest Arm Brook are probably those of a telegraph line of the New York, Newfoundland and London Telegraph Company which operated in the area in the late nineteenth century. Line shacks associated with the telegraph line are believed to have been located at Couteau Brook and Connoire Bay. However, their locations are not precisely known and no evidence of their remains was found during the field survey. As well, winter houses used by South Coast residents during the nineteenth

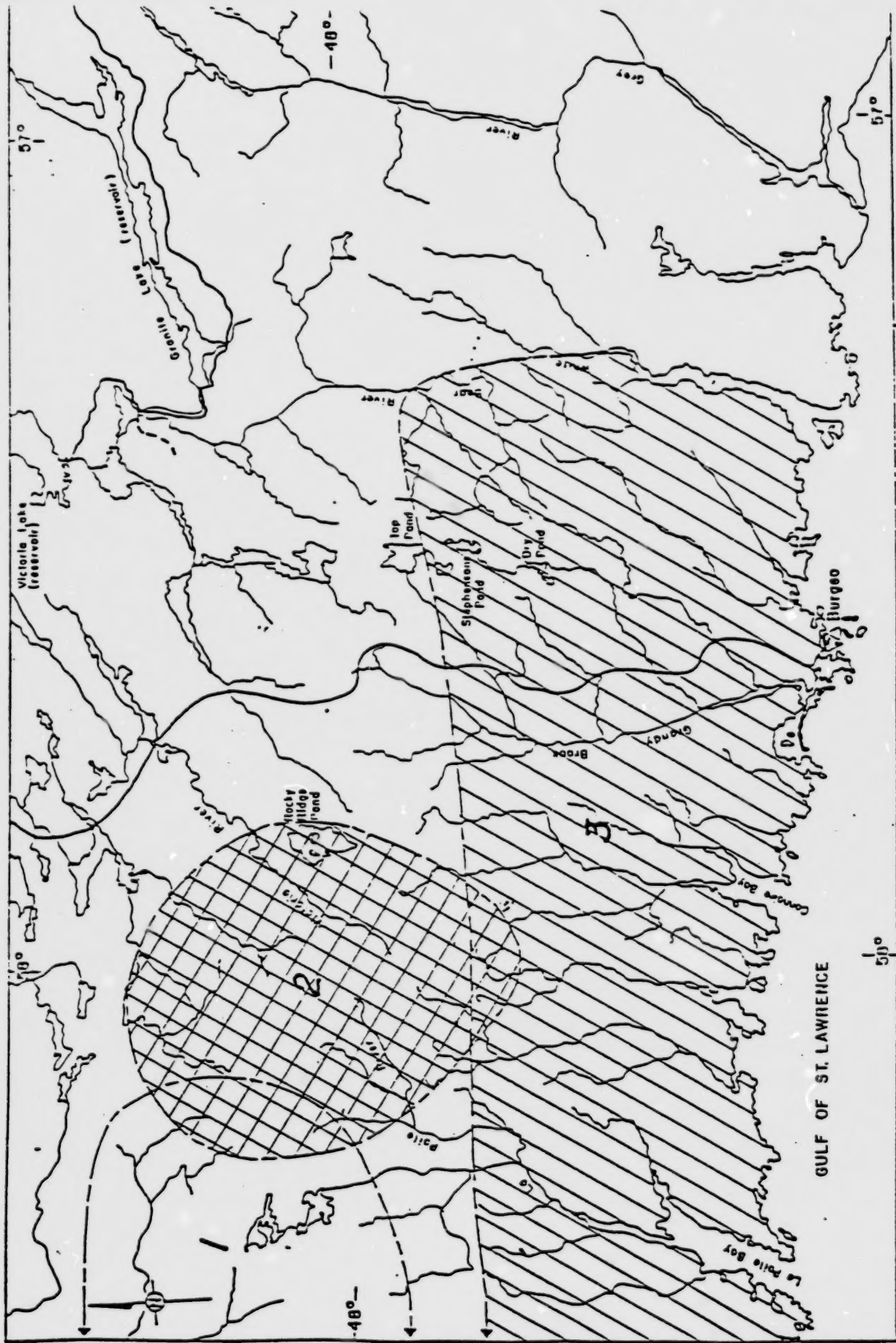


FIGURE 5. ESTIMATED RANGE OF THE LA POILE CARIBOU HERD PRIOR TO 1985. 1. POST CALVING RANGE
2. CALVING RANGE
3. WINTER RANGE
(FROM NORTHLAND ASSOCIATES LTD. 1982)

10 km
5 km
NORTHLAND ASSOCIATES LTD

century are believed to have been built in the bottoms (inland extremity) of the bays below the major streams crossed by the transmission line. No evidence of their remains was found during the field survey (Penney 1986).

3.1.6 Resource Utilization

Trapping

Northland Associates (1982) reported that trapping in the Burgeo area is mainly a recreational activity and is primarily confined to the vicinity of Route 480, and streams which can be reached from the coast. Thirty-nine residents of Burgeo were reported to have purchased trapping licences during the 1979-80 season, and 34 in the 1980-81 season. Trapping does not contribute significantly to the income of Burgeo residents (Northland Associates 1982).

Hunting

The proposed transmission line route lies within moose Management Area number 19 and caribou Management Area number 61. Hunting activity is mainly concentrated in the vicinity of Route 480, and areas that can be reached by boat such as Grandy Brook valley. Boats are also used to travel to Connoire Bay and Couteau Bay where hunting is restricted to an area within about eight kilometres of the coast (Strickland pers. comm.).

Angling

Grandy Brook is the only scheduled Atlantic salmon river along the route. However, Atlantic salmon are known to be present in Couteau Brook which is being considered for designation as a scheduled river (Porter pers. comm.). In

addition to anadromous Atlantic salmon and the landlocked variety or ouananiche, both resident and anadromous eastern brook trout (Salvelinus fontinalis), American smelt (Osmerus mordax), American eels (Anguilla rostrata) and alewife (Alosa pseudoharengus) are among freshwater fish species known to inhabit selected south coast rivers crossed by the transmission line.

Angling activity on Grandy Brook is concentrated in the lower seven kilometres. However, all the lower reaches of Grandy Brook, including the area of the transmission line crossing are used by anglers (Hann pers. comm.).

Cabins

Cabins have been built along the lower sections of Grandy Brook, but none are located within one kilometre of the right-of-way.

There are no hunting or fishing camps within one kilometre of the right-of-way.

SECTION 4

IMPACT ASSESSMENT AND MITIGATION

Environmental impact assessment is a predictive planning tool that identifies the potential impacts of a proposed development and suggests measures to mitigate or compensate for those impacts (Kiell et al. 1985). In preparing the EIS for the proposed Grandy Brook Station to Hope Brook station transmission line, details of project design, construction and operation have been carefully considered with respect to valued ecosystem components in order to identify and minimize potential impacts.

It is Hydro's experience that, given proper planning, transmission lines can be designed, constructed and operated in an environmentally acceptable manner. In particular, such construction related environmental impacts as erosion and sedimentation of watercourses can be minimized or avoided by good planning and construction techniques.

Environmental protection for transmission lines begins at the route selection stage when the technical, economic and environmental parameters of potential routes are evaluated. Particular attention is given to minimizing the number of stream crossings (particularly scheduled Atlantic salmon streams), and avoiding whenever possible National and Provincial parks, ecological and wilderness reserves (either proposed or established), domestic water supply areas, historic resources, and known sensitive wildlife areas such as caribou calving grounds and waterfowl breeding areas.

During project construction and operation, environmental protection will be provided through adherence to environmental conditions in government permits and approvals, the

implementation of a project specific environmental protection plan (Hydro 1987), and the implementation of environmental protection clauses in contracts. This protection will be enhanced by self-regulatory compliance monitoring (Barnes et al. 1986).

4.1 ENVIRONMENTAL PROTECTION PLAN

As an aid in achieving the goal of minimal environmental impact during the construction and operation of the proposed transmission line, Hydro has prepared a project specific environmental protection plan (Appendix II). This document contains material relevant to situations and activities associated with the construction and operation of the transmission line. It includes site specific mapping of areas of environmental concern and highlights the environmental protection measures to be implemented. It is a field usable document which provides specific guidance for field activities and decision making. As well, the specific environmental protection plan forms the basis of environmental protection clauses for contract documents.

The project specific environmental protection plan is based on a generic plan which provides environmental protection measures for the range of conditions and field activities that are relevant to the construction and operation of transmission facilities in Newfoundland and Labrador (Hydro 1987). The generic plan is primarily a reference document and a general guide for construction and operation.

Both the generic and specific environmental protection plans direct, as clearly as possible, the activities which occur during the construction and operation of transmission facilities to ensure maximum environmental protection. However, these plans cannot hope to cover, in detail, the

complete range of situations which may arise. Good judgement and decision making by environmental and construction inspectors are essential to effective environmental protection. Therefore, the plans also specify criteria on which to base field decisions.

The project specific environmental protection plan provides educational guidelines for Hydro's engineers, project managers, contractors and construction personnel.

4.2 PREDICTED IMPACTS

4.2.1 Terrestrial and Aquatic Habitat

The use of heavy equipment during the construction and operation of the proposed transmission facility will result in some disturbance of soil, vegetation and watercourses. The impacts of terrain disturbance may be long lasting, as in the case of tracks which are maintained by vehicles involved in line inspections, or of relatively short duration such as a small infusion of sediment into a stream. It is very difficult to provide an exact definition for the duration of "long and short" term impacts. The duration of impacts depends upon their type, magnitude and site-specific conditions. It is recognized that the time required to flush a small infusion of sediment from stream substrate can range from hours to years.

Terrestrial Habitat

Potential impacts of the construction and operation of the proposed transmission line on terrestrial habitat include:

- (1) contamination with pollutants such as fuel;

- (2) fire caused by accident or improper handling of flammable materials; and
- (3) disturbance of vegetation and soil resulting in erosion.

Any impacts of a spill of fuel would probably be confined to the immediate area of the spill and would probably not be detectable within a 12 month period.

The effects of a fire in wooded areas could be widespread, and significantly alter the ecology of the area. Damman (1983) reported that forest cover was eliminated from much of the Maritime Barrens Ecoregion by the combined effects of frequent fires, poor regeneration after fires, climatic conditions which are marginal for tree growth, and competition from ericaceaeous shrubs. Fire would have less impact in the treeless areas because of the lack of fuel and wetter conditions. The probability of fire being caused by the construction or operation of the proposed transmission line will be minimized by the implementation of fire prevention measures contained in the environmental protection plan and in contract documents.

The effects of disturbing vegetation and soil during construction and maintenance activities must be considered a residual impact as they will be visible at least for the life of the facility and beyond. However, any erosion resulting from these activities will be restricted to the immediate vicinity of the activity and will be of minor significance because of the thin soil, and also because of the protection and rehabilitation measures that will be implemented. For example, the access route will essentially consist of two tracks worn down to mineral soil or bedrock within the right-of-way.

Other than the use of some borrow material during construction, the proposed transmission facility will have no impact on the aggregate resource.

Aquatic Habitat

Potential impacts of the proposed transmission line on aquatic habitat consist of:

- (1) the introduction of pollutants such as hydrocarbons as a result of improper fuel handling procedures, or sewage from camps;
- (2) the introduction of sediment as a result of erosion, pumping out pole excavations, or directly from vehicles; and
- (3) the impairment of fish movement as a result of improper ford construction.

Such impacts could result in direct fish mortality and reduced productivity as a result of habitat degradation. However, any impacts on aquatic habitat will be of short duration and will not significantly reduce fish populations or productivity. This prediction is based on the careful selection of fording sites to avoid spawning habitat and the implementation of protection measures described in the environmental protection plan and in the contracts.

Impacts of herbicides will not occur because vegetation within the right-of-way will be controlled using manual techniques. The only sections of the transmission line right-of-way which will require vegetation control are those within valleys. The relatively short distances of right-of-way which will require vegetation control, and their location

on steep slopes in close proximity to watercourses, render manual techniques preferable to the use of herbicides for vegetation management.

4.2.2 Water Resources

If fording sites were not correctly selected and used, there would be a potential for bank erosion and the introduction of sediment into streams. However, given that the substrate at fording sites is primarily bedrock and/or boulder, and that the banks are stable with gentle slopes, the potential for adverse impacts on water resources is minimal. This prediction is substantiated by the estimates of one in two year flood flows presented in Section 3.1.3. The effects of small amounts of sediment introduced into streams as a result of fording will be of short duration (less than one year).

4.2.3 Wildlife Resources

Raptors

Potential impacts of the proposed transmission line on raptors include:

- (1) increased mortality due to electrocution, collision with conductors and illegal shooting; and
- (2) decreased reproductive success as a result of disturbance caused by construction or maintenance activity.

Fudge, Lane and Associates (1987) reported that increased mortality due to electrocution is unlikely because the conductors on a 138 KV transmission line are too far apart to be touched simultaneously. Collisions between raptors and

conductors are not a major problem because of the large size of the conductors and the high visual acuity of the birds. Illegal shooting of raptors occurs most frequently along roads. Consequently, because there will not be an access road associated with the proposed line, illegal shooting is not considered to pose a major impact. Although the proposed right-of-way contains suitable nesting habitat for local raptors, no nests were observed during the survey. It was suggested that disturbance of raptors during the breeding season (April-July) by construction or maintenance activities would constitute the most serious potential adverse impact of the proposed development. Since most of this activity will occur outside the critical period, potential impacts on raptors can be considered negligible.

Caribou

The La Poile caribou herd was identified as a valued ecosystem component that might be adversely affected by the proposed transmission line. Potential impacts of a transmission line on caribou may include modification of movement patterns, thereby affecting habitat utilization, increased mortality due to legal and illegal hunting, and increased harassment. Transmission lines may present a behavioral barrier to caribou, thereby disrupting their access to habitat. This has been documented for Scandinavian reindeer (Villmo 1975, Gaare 1986). The latter two impacts may result from improved access provided by the facility. Caribou numbers along the proposed route are relatively low during the hunting season (September 13 - November 1 in 1986) (Northland Associates 1986). Nevertheless, the legal and illegal harvest of the herd may increase as a result of improved access. Harassment of the herd on the winter calving and post-calving grounds may increase if people follow the transmission line into these sensitive areas.

The effects of development on caribou populations are not completely understood nor is there consensus within the scientific community on such impacts (Bergerud et al. 1984). In Newfoundland, caribou routinely migrate under a number of transmission lines. For example, the Buchans herd crosses under the 230 kV transmission line between Buchans and Bottom Brook at Star Lake. The Upper Salmon Hydroelectric Project, which was constructed within the post-calving range of the Grey River Herd, has not significantly affected the productivity, size or age structure of that Herd (Kiell et al. 1986). Monitoring studies conducted during and after construction suggested that caribou became sensitized to construction activity, and avoided the project area. Following completion of the project, caribou returned to the area, and appear to be utilizing that habitat as before (Hill 1985, Northcott 1985).

Construction of the proposed transmission line is expected to take approximately 10 months, and employ about 45 people. The primary mode of transportation will be slow moving tracked vehicles with some helicopter support. In contrast, the Upper Salmon Hydroelectric Project employed over 700 workers, took three years to construct, and required the extensive and intensive use of heavy earth moving equipment often at relatively high speeds over access roads.

A short term impact (during construction) will be the disturbance of caribou which encounter workmen and/or work activities. Hydro's experience during construction of the Upper Salmon Project (Hill 1985) suggests that caribou will maintain what they consider to be a "safe distance" from workers and equipment, and continue their "normal" activities. It is predicted therefore, that construction of the proposed transmission line will not have a statistically significant impact on the population of the La Poile herd.

It is also suggested that construction will not alter the movement pattern of the herd. Similarly, it is very unlikely that maintenance activity will alter the population or movement patterns of the herd.

In the long term (over the life of the transmission line), increased levels of mortality due to legal and illegal hunting and harassment might result in a statistically significant decline in the size of the La Poile herd. This possible impact was identified in a risk assessment study (Fudge, Lane and Associates 1986) using various hypothetical changes in rates of survivorship. However, presumably a significant decline in the herd would be detected by surveys, and halted by implementing different management and/or enforcement strategies.

Given the fact that caribou in several herds regularly cross under transmission lines on the Island and have apparently increased in numbers over the past 20 years (Bergerud 1971, Mercer et al. 1985) it appears unlikely that the proposed facility will significantly affect the size or the movement patterns of the La Poile herd.

4.2.4 Historic Resources

Penney (1986) indicated that the only potential adverse impact of the proposed transmission facility on historic resources would be the inadvertent destruction of a 19th century line shack owned by the New York, Newfoundland and Labrador Telegraph Company which is believed to be located near Couteau Brook. A positive impact would be finding the line shack. Parts of the telegraph line have been found during the survey of the proposed transmission line route and will be plotted on a map.

4.2.5. Resource Utilization

The proposed transmission line may result in some increased resource utilization through improved access. People who might not have been willing to travel away from the Burgeo road for fear of becoming lost may do so when there is a transmission line to follow, even if there is no access road. The effect of this potential increase in consumptive use of the resources of the area will depend on the magnitude of the increase and the individual resources. Increased use of the area may also result in an increase in the number of illegal cabins.

4.3 MITIGATION

A wide variety of mitigative measures, ranging from the careful selection and flagging of travel routes and fording sites to the instruction of inspectors by a professional archaeologist, have been instituted for this undertaking. One of the principal mitigative measures is the project specific environmental protection plan (Appendix II) which clearly describes how the goal of minimal environmental impact is to be attained. Most of the measures in the environmental protection plan have been incorporated in the clearing and construction contracts to enhance compliance. Hydro is also implementing a comprehensive compliance monitoring program during construction, which includes Construction Inspectors and an Environmental Coordinator, to ensure maximum protection of the environment.

The environmental protection plan (Appendix II) contains the mitigative measures that have been proposed for the undertaking. To avoid unnecessary repetition, the appropriate sections in the environmental protection plan are cited below for the various valued ecosystem components.

4.3.1 Terrestrial and Aquatic Habitat

Mitigative measures to protect terrestrial and aquatic habitat have been defined for both the construction and operation phases of this project. Refer to Sections 2.2, 2.3, 2.4, 2.5, 2.6, 2.9, 2.10, 2.11, 2.12, 2.13, 3.1, 3.3, 3.4, 3.5, 3.6, 3.9, 3.10, 5.1, 5.2, 5.3, 5.5, 5.6, and 5.7 in Appendix II.

4.3.2 Water Resources

Measures to mitigate adverse impacts on water resources are similar to those suggested for aquatic habitat. The primary mitigation is the selection of fording sites with low potential for erosion and the use of proper fording techniques. Refer to Sections 3.1, 3.5, 5.2, and 5.3 in Appendix II.

4.3.3 Wildlife Resources

The primary mitigative measures for wildlife are the prohibition of construction activity between May 15 and June 15, 1987 between km 21.0 and the Mine, and the scheduling of routine line maintenance activities outside the period May 1 to July 31.

Helicopter inspections of the transmission line are scheduled for early to mid-March, early August, mid-September, and early to mid-December. The winter ground inspection is scheduled for early March,, depending upon snow conditions. This schedule may vary somewhat, depending upon caribou activity along the transmission line.

Ospreys (Pandion haliaetus) frequently nest on transmission line structures. Should this occur, appropriate measures,

such as those described by Toner and Bancroft (1986), will be implemented to protect both the birds and the structures.

Refer to Sections 2.3, 2.7, 3.7 and 5.4 in Appendix II.

4.3.4 Historic Resources

In order to minimize the potential for adverse impacts on historic resources, surveyors, Construction Inspectors and the Environmental Coordinator have received instruction from a professional archaeologist. Specific protection measures are found in Sections 2.8, 3.8 and 5.7 in Appendix II.

4.3.5 Resource Utilization

No mitigative measures are proposed.

SECTION 5

REHABILITATION

The primary objective of Hydro's rehabilitation strategy is to stabilize erodable soils in disturbed areas. A secondary objective is to restore the aesthetic appeal of such areas. These objectives can best be met by restoring a suitable grade, spreading stockpiled topsoil and organic material, and allowing revegetation to occur naturally by the invasion and establishment of endemic species. Occasionally, however, it is necessary to seed or plant an area if mechanical stabilization techniques are inadequate. Rehabilitation begins early in the planning process when access routes and construction practices are defined to minimize potential disturbance. Subsequently, site-specific measures are implemented to meet the objectives of the strategy.

Rehabilitation measures are contained in the environmental protection plan. Refer to Sections 2.4, 2.10, 2.11, 2.12 and 3.5 in Appendix II.

SECTION 6

MONITORING

6.1 ENVIRONMENTAL COMPLIANCE MONITORING

Hydro will institute a monitoring program during construction and operation of this facility with the objectives of:

- (1) ensuring compliance with all government Acts and regulations;
- (2) ensuring that Environmental Impact Statement commitments and conditions are met; and
- (3) ensuring that Hydro's environmental practices and standards are maintained.

Environmental compliance monitoring on-site will be the responsibility of the Construction Inspectors and the Environmental Coordinator. Construction Inspectors will ensure implementation of the general and special environmental protection measures which are specified in the clearing and construction contracts. The Environmental Coordinator, who is experienced in construction methods and equipment as well as construction related environmental protection techniques, will coordinate the implementation of environmental protection measures. The Environmental Coordinator, Mr. David Vokey, is a member of Hydro's Environmental Services Department and will be assigned to the Jobsite for the duration of construction. Mr. Vokey can be reached at:

Newfoundland and Labrador Hydro, Construction Division
P.O. Box 626, Stephenville, Nfld
A2N 3B5 Telephone: 643-9664

The Environmental Coordinator's main responsibilities will be as follows:

- (1) coordinating all environmental activities and decisions to be made by Hydro as per the specific environmental protection plan and as outlined in contracts and permits;
- (2) instructing and advising Construction Inspectors on environmental protection measures to be implemented; and
- (3) monitoring Contractors' compliance with contract clauses, permit conditions, and the commitments made in the environmental protection plan and in the EIS.

The on-site environmental compliance monitoring program is considered to be a critical component of Hydro's environmental protection strategy. It is presented in Section 4 of Appendix II.

6.2 ENVIRONMENTAL EFFECTS MONITORING

Environmental effects monitoring refers to scientific studies which may have some or all of the following objectives (Duinker 1985):

- (1) "to test impact predictions and thus further environmental understanding and improve predictive capability";
- (2) "to check the effectiveness of mitigation measures";

- (3) "to provide early warning of undesirable change so that corrective measures can be implemented"; and
- (4) "to provide evidence to refute or support claims for compensation".

Not all predicted impacts, mitigation measures and valued ecosystem components merit effects monitoring studies (Duinker 1985, Kiell et al. 1985). The only environmental effects monitoring study warranted by the Grandy Brook Station to Hope Brook Station transmission line examines possible impacts on the La Poile caribou herd. This study will be a cooperative effort by Hydro and the Newfoundland Wildlife Division.

In order to identify and monitor any impact of the transmission line on the distribution and movement patterns of the La Poile herd, surveys will be flown along the proposed right-of-way at bimonthly intervals beginning in October 1986. All caribou observed within a corridor 2 km in width will be counted and classified, and any observed human activity will be recorded. These surveys will continue until December 1988, thereby providing information before, during and after construction. The numbers and locations (especially of migration routes) of caribou observed within the corridor will be compared over the study period. The classification data will be statistically compared with similar data collected on the entire herd. The null hypothesis for this study is that the proposed transmission line will not significantly affect the movement patterns of the La Poile herd. The study will be reviewed in early 1989 and the need for additional work will be evaluated. Should a significant change in migratory patterns be observed, a study will be undertaken to ascertain the causative factors.

The null hypothesis that the population of the La Poile herd will not decrease as a result of the construction and operation of the proposed transmission line will be tested by comparing census data collected in 1986 with future population estimates. Hydro will fund the next census (1988) of the La Poile herd. It is recognized that it may be difficult to separate potential impacts of the Mine from those of the transmission facility.

SECTION 7

PUBLIC INVOLVEMENT

Public meetings were held in Grand Bruit and Burgeo on August 7, 1986 . The objectives of these meetings were:

- (1) to fully describe the proposed transmission line and its potential environmental impacts; and
- (2) to record any concerns that may be expressed by the residents of Grand Bruit and Burgeo regarding potential environmental impacts of the proposed transmission line.

Adequate prior notification of the public meetings was provided by Hydro. Notices were posted in the two general stores in Grand Bruit and on the community services channel of the Burgeo Broadcasting Center approximately 20 days prior to the meetings. The Minister of Environment was notified of the meetings as required by the Environmental Assessment Regulations.

The meetings were attended by the following Hydro representatives:

- | | |
|------------------|---|
| (1) G. Alexander | Manager, Rates and Financial Planning Department; |
| (2) D. Butt | Senior Transmission Design Engineer; |
| (3) J. Haynes | Senior Transmission Planning Engineer; and |

(4) E. Hill

Senior Ecologist,
Assessments and Research.

Neither meeting was attended by a representative of the Minister of Environment.

The format of meetings was similar in both communities. Prior to opening the meetings, copies of an information package (Appendix III) were distributed to attendees. Following introduction of the Hydro representatives, the proposed project was described. The environmental assessment process, and its application to the project were briefly discussed. The environmental concerns that were identified through review of the registration were discussed along with Hydro's responses to those concerns. The meetings were then opened to questions from the attendees. Questions and replies were not tape recorded, but notes were taken by the Hydro representatives (Appendix IV). All questions were addressed at the meetings. Additional copies of the information packages were left in both communities along with the address and telephone number of a Hydro representative, should further questions or comments arise.

The public meeting in Grand Bruit was held at 11:00 a.m. in the B & M Amusement Center. It was attended by 19 residents of the Community. The public meeting in Burgeo was held at 7:30 p.m. in the Lions Club Community Center. It was attended by seven residents of the Town.

The primary concerns of the residents who attended the meetings were related to the reliability of the new source of electricity, and its impact on heating costs. Only one environmentally related question was posed, and that was with respect to a work stoppage to mitigate the impact of construction on caribou. Hydro replied that such a measure had been

implemented during construction of the Upper Salmon Hydro-electric Development and that it would be considered for the present project.

It was concluded that the residents of Grand Bruit and Burgeo had few, if any, concerns regarding potential environmental impacts of the proposed transmission line.

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APPENDIX I

PERSONNEL RESPONSIBLE FOR

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Mr. Hill has been with Hydro for four years.

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APPENDIX II

ENVIRONMENTAL PROTECTION PLAN FOR THE

CONSTRUCTION AND OPERATION OF THE

TRANSMISSION LINES CONNECTING THE

BOTTOM BROOK, GRANDY BROOK,

HOPE BROOK AND BURGIO STATIONS

FOREWORD

Hydro prepared one environmental protection plan for both the transmission line from Grandy Brook Station to Hope Brook Station (TL 255), and that from Bottom Brook Station to Grandy Brook Station and Burgeo (TL 250). This was done because the two lines are physically connected, and also because they are both to be in service by December 31, 1987. For completeness, and hopefully to avoid confusion, the complete environmental protection plan (including maps) is presented as Appendix II. It should be recognized that the Fisheries and Oceans Authorization (No. 2-378) and the Department of Environment Certificate of Approval (No. C.A. 86-10-697) presented in Section 6 pertain to the Bottom Brook Station to Grandy Brook Station and Burgeo transmission line (TL 250) which has been discharged under the Environmental Assessment Act. Permits and authorizations cannot be obtained for the Grandy Brook Station to Hope Brook Station transmission line (TL 255) until the EIS has been accepted as satisfactory by the Minister of Environment.

The following sections of the environmental protection plan are relevant only to the Bottom Brook Station to Grandy Brook Station and Burgeo transmission line (TL 250):

- | | | |
|-----|--|-----------------------------|
| (1) | Section 3.1(a) | Watercourse Crossings |
| (2) | Section 3.2(b)
3.2(c) (i)-(v)
3.2(d)
3.3(e) | Access to Site |
| (3) | Section 3.4(a)
3.4(c) (i) and (ii)
3.4(d) | Sensitive Areas |
| (4) | Section 3.6(c)
3.6(k)-(p) | Clearing and Timber Salvage |
| (5) | Section 5.5(b) | Vegetation Control |
| (6) | Section 6 | Permits |
| (7) | Drawing B1-250-T-6 | Sheets 1 to 9 |

ENVIRONMENTAL PROTECTION PLAN FOR THE
CONSTRUCTION AND OPERATION OF THE
TRANSMISSION LINES CONNECTING THE
BOTTOM BROOK, GRANDY BROOK, HOPE BROOK AND BURGEO STATIONS

NEWFOUNDLAND AND LABRADOR HYDRO
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OCTOBER 1986
REVISED JANUARY 1987

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SECTION 1

INTRODUCTION

This specific environmental protection plan (EPP) is a field useable document which describes the environmental protection measures to be implemented during the construction and operation of TL 250 (Bottom Brook Station to Grandy Brook Station), TL 255 (Grandy Brook Station to Hope Brook Station) and the Grandy Brook Station to Burgeo substation distribution line. This document is based on the environmental protection measures described in "A Generic Environmental Protection Plan for Newfoundland and Labrador Hydro Transmission Facilities" (Newfoundland and Labrador Hydro 1986).

This specific EPP has been prepared to assist Hydro in the supervision of field activities and as a guide for decision making in the field. It will also be of interest to federal and provincial government personnel, and members of the general public who wish to know how construction and operation activities will be managed to minimize potential environmental impacts. Where applicable, protection measures identified in this document are and will be included in appropriate sections of tender and contract documents. This will enhance contractors' compliance with required environmental protection measures.

Other documents relevant to this EPP are:

- (1) the Environmental Impact Statement of which this project specific EPP is a component;
- (2) contract documents;
- (3) permits issued by federal, provincial and municipal agencies pursuant to relevant environmental legislation (see Section 6); and
- (4) Hydro's generic EPP for transmission facilities.

The use of "Owner" in this document is synonymous with "Hydro" as this facilitates the direct incorporation of specific environmental protection measures in contract documents.

SECTION 2

GENERAL PROTECTION MEASURES FOR CONSTRUCTION

2.1 Owner's (Hydro) Policy

It is Owner's policy to protect the environment of the areas where the project is located. To ensure protection of the environment, the work at all times shall be subject to inspection by Owner and staff of relevant provincial and federal agencies. Normally, all inspections other than by Owner will be arranged in advance through Owner. Any specific matters relating to environmental protection will be dealt with between Contractor and Owner.

2.2 Contractor's Responsibilities

- (a) Contractor shall ensure that its employees and its Subcontractors and their employees comply with the conditions of the contract and with all applicable environmental laws, regulations, permits, and requirements of federal, provincial and municipal authorities, and such other rules and regulations as Owner may establish. General requirements are detailed in this section. Specific requirements are detailed in Section 3, Special Protection Measures for Construction.
- (b) Owner will obtain and provide Contractor with the following permits where such are required:
 - (i) permits from the Newfoundland Department of Environment for all watercourse crossings;
 - (ii) authorization from Fisheries and Oceans Canada for all watercourse crossings; and
 - (iii) permits from the Newfoundland Department of Mines and Energy for all borrow areas.

Contractor shall obtain all other permits and approvals which may be necessary to comply with government laws and regulations.

2.3 Contractor and Subcontractors' Personnel

- (a) Contractor, Subcontractors and their personnel shall not feed or harass wildlife.

- (b) Contractor, Subcontractors and their personnel shall in no way interfere with trap lines or associated equipment.
- (c) Employees shall not be permitted to have firearms on the Jobsite, other than sealed units under the supervision of Owner, for control of nuisance animals.
- (d) Any contravention of environmental requirements, including employee actions accidental or otherwise, resulting in environmental damage shall be reported to Owner without delay. Contractor shall be responsible for clean-up, reclamation and/or restorative measures as may be directed by Owner, or provincial or federal agencies.

2.4

Storage, Handling and Transfer of Fuels and Other Hazardous Material

- (a) Contractor, Subcontractors and their personnel shall take all necessary precautions to minimize the spillage, misplacement, or loss of fuels and other hazardous material.
- (b) All storage tank systems must be registered under and in compliance with Newfoundland Regulation 258/82, The Storage and Handling of Gasoline and Associated Products Regulations, 1982 before commencing operation. Registration does not apply to storage tank systems of a capacity less than 2500 litres that are connected to a heating appliance, nor to overhead storage tank systems supported above grade, if less than 2500 litres. Contractors shall supply verification of storage tank registration to the Owner.
- (c) Contractor shall ensure that fuels and hazardous materials are handled only by personnel who are trained and qualified in handling these materials in accordance with manufacturers' instructions and government regulations.
- (d) Oils, greases, gasoline, diesel or other fuels will be stored at least 100 m from any surface water unless otherwise approved by the Owner.
- (e) Handling and fueling procedures shall be such that contamination of ground or water shall not occur.

- (f) Any above ground fuel containers with the exception of those exempted under Newfoundland Regulation 258/82, shall be positioned over an impervious mat and shall be surrounded by an impervious dyke of sufficient height (minimum height 0.6 m) to contain not less than 110% of the capacity of the tank. When more than one tank is enclosed in the dyke area, the dyke shall be of sufficient height to contain the volume of the largest tank plus the greater of 10% of the aggregate volume of all the other tanks or 10% of the volume of the largest tank.

All dykes of earthwork construction shall have a flat top not less than 0.6 m wide, and be constructed and maintained to be liquid tight to a permeability of 25 litres per square metre per day. The distance between a storage tank shell and the centre line of a dyke shall be at least half the tank height.

- (g) Fuel storage areas and non-portable transfer lines shall be clearly marked or barricaded to ensure that they are not damaged by moving vehicles. The markers shall be visible under all weather conditions.
- (h) Waste oils and lubricants shall be retained in a tank or closed container, and disposed of, subject to Owner's approval, in a manner which does not cause pollution.
- (i) Storage tank systems shall be inspected on a regular basis as per Section 20 of Newfoundland Regulation 258/82. This involves, but is not limited to, gauging or dipping, reconciliation of records, and the proper maintenance of reconciliation records for a period of two years.
- (j) Contractor and Subcontractors shall, before transporting or positioning fuel or oil, present to Owner a copy of the oil spill contingency plan which is required under Newfoundland Regulation 258/82.

Contractor and Subcontractors shall abide by the following measures in the event of the detection of a fuel or hazardous material spill of 70 litres or more:

- (i) make every effort to stop leakage and contain contaminant flow;

- (ii) immediately upon detection, report spill location and size to the Canadian Coast Guard spill report number 722-2083 and Owner; follow up with a full written report containing information on the cause of the spill, remedial action taken, damage or contamination estimate, and any further action to be taken;
- (iii) remove contaminant from spill site by sorbent, pumping, burning, or whatever method is appropriate and acceptable to Owner, and then dispose of contaminated debris at an approved disposal site (see Section 2.5); and
- (iv) take all necessary action to ensure that the incident does not recur.

Contractor shall apply the following criteria in reaching decisions on containment and clean-up procedures:

- (i) minimize danger to persons;
 - (ii) minimize pollution to watercourses;
 - (iii) minimize the area affected by a spill; and
 - (iv) minimize the degree of disturbance to the area and watercourses during clean-up.
- (k) Smoking shall be prohibited within 10 m of a fuel storage area.
 - (l) Fueling or servicing of mobile equipment shall not be allowed within 30 m of a watercourse except within a refueling site as approved by Owner, i.e., where conditions allow for containment of accidentally spilled fuels.
 - (m) The owner of a storage tank system shall, within 30 days of known abandonment, empty the system of all products, remove the tank and associated piping from the ground, remove any contaminated soil, clean the area and restore the site to the satisfaction of Owner.

Contractor shall dispose of any soil contaminated by small leaks of oil or grease from equipment in a manner approved by Owner (see Section 2.5).

- (n) No pesticides or other toxic chemicals shall be used without prior approval of Owner. Each chemical to be used, its application, restraint, and area of use shall be subject to regulation under the Newfoundland Pesticides Control Act, 1983.

2.5

Waste Management

- (a) Contractor shall collect and dispose of all waste produced by its employees and those of its Subcontractors in a manner approved by Owner. All waste shall be incinerated or removed from the Jobsite wherever possible and disposed of in a waste disposal site approved by the Minister of Environment pursuant to the Waste Material Disposal Act, 1973. The permission of the Operator shall be obtained for disposal at an existing waste disposal site. No waste material shall be deposited in any watercourse.
- (b) Construction waste material shall be collected and incinerated or removed to an approved waste disposal site as outlined above. No debris shall be allowed to enter any watercourse.

2.6

Marshalling Yards

- (a) Equipment and material storage yards shall be located at least 30 m from any watercourse unless otherwise authorized by Owner.
- (b) The site should be of low value with respect to its potential for other uses when compared to other lands in the area. Abandoned gravel pits, abandoned commercial enterprises, or other previously disturbed areas are preferred locations.
- (c) The site should be located to minimize potential traffic hazards. Incoming and outgoing vehicles should be able to merge safely with other traffic.

2.7

Aircraft

- (a) Aircraft with no specific requirements for low-level flying are restricted to minimum flight altitudes of 800 m above ground level.
- (b) Ground and air access within 800 m of a known raptor nest is prohibited except with written permission from Owner.

- (c) Harassment of wildlife is prohibited.

2.8 Protection of Historic Resources

- (a) All fossils, articles of value of antiquity, and other remains, or things of geological or archaeological interest or value discovered on the Jobsite shall be deemed to be the property of the Crown. Contractor shall take all reasonable precautions to prevent its employees or other persons from removing or damaging any such articles or things.
- (b) The Owner shall be notified immediately upon discovery and before removal of any historic resources.
- (c) In the event of the discovery of an historic resource, all work shall cease in the immediate area of the discovery until such time as Owner, having consulted with the Historic Resources Division, advises those involved as to the disposition of the discovery and authorizes resumption of the Work.

2.9 Temporary Work Camps

- (a) The Contractor is responsible for obtaining all appropriate permits from government agencies with legislation and regulations relevant to camp facilities. These permits include but are not necessarily limited to those related to solid and liquid waste disposal, water supply, sewage treatment, development control, and Crown lands.
- (b) The area to be cleared for temporary construction camps shall be minimized and existing cleared areas shall be used whenever possible.
- (c) Camps shall not be permitted within 100 m of any watercourse unless otherwise approved by Owner.

2.10 Borrow Areas

- (a) The number of borrow areas opened during transmission facility construction and operation shall be minimized.

- (i) Borrow material from tower and pole excavations shall be used wherever possible.
- (ii) Existing borrow areas shall be used wherever possible.
- (b) Borrow areas used during construction and operation shall adhere to all relevant federal, provincial and municipal acts and regulations.
 - (i) Owner will obtain from the Department of Mines and Energy, under The Quarry Materials Act, 1976, a blanket permit to borrow material as required for construction and operation of the transmission line.
- (c) The development of borrow areas shall be controlled so as to minimize potential environmental damage.
 - (i) The area to be excavated shall be clear cut of all vegetation prior to the removal of any borrow material;
 - (ii) All stumps, organic material and topsoil shall be stripped from the area to be excavated and stockpiled at least 5 m from uncleared areas; stockpiled strippings will be kept at least 5 m from the area of excavation;
 - (iii) Upon completion of excavation, the area disturbed shall be graded to slopes less than 30%;
 - (iv) Following sloping, the topsoil and any organic materials shall be respread over the disturbed area;
 - (v) Borrow areas shall be located a minimum of 150 m from any watercourse. Deviations from this requirement may only be made with the permission of Owner;
 - (vi) Borrow areas shall be located a minimum of 100 m from any roadway except where permission is obtained from Owner for a lesser distance;

- (vii) Borrow areas shall be located a minimum of 15 m from private property unless prior written consent of the owner of the private property is obtained.

2.11

Clean-up

- (a) During the progress of the Work, Contractor shall keep the areas occupied by it and access to such areas in a neat, clean, and safe condition, and free from accumulation of crating materials, waste and rubbish.
- (b) On completion of any portion of the Work, Contractor shall promptly remove from the work area, all of its Construction Plant and surplus Material to an approved storage area. Upon completion of the Work and before the letter of Final Acceptance is issued, Contractor shall, at its own expense and to the satisfaction of Owner, dispose of or remove from the Jobsite all Construction Plant, rubbish, unused Material, including concrete forms, and other equipment and materials belonging to it or used under its direction during the performance of the Work and shall leave the premises in a neat and clean condition.
- (c) In the event of Contractor's failure to promptly comply with any of the foregoing, the same may be accomplished by Owner at Contractor's expense and the cost of same may be deducted from any money due or becoming due to Contractor whether under this or any other contract.

2.12

Revegetation

- (a) As soon as possible following construction activities, Owner will identify areas requiring seeding and/or planting for rehabilitation purposes. These will include:
 - (i) areas adjacent to watercourses where erodible soil has been exposed and where mechanical stabilization techniques are not judged to be sufficient to guarantee stability or prevent uncontrolled introduction of sediment into watercourses;
 - (ii) areas within community boundaries or adjacent to existing roads where erodible soil has been exposed and is judged to be in an unsatisfactory condition for aesthetic or recreational reasons;

- (iii) any other areas judged to need assisted revegetation.
- (b) Seeding and planting requirements will be based on site specific soil analysis and on consideration of the objectives outlined in (a) above.
- (c) The revegetation program will begin as soon as possible after construction activity has stopped, although seeding or planting may be delayed because of seasonal weather conditions.
- (d) Owner will inspect all revegetated areas periodically for a sufficient time to ensure adequate results have been achieved. Additional revegetation work will be undertaken if required to achieve the objectives outlined in (a) above.

2.13 Forest Fire Protection

Contractor shall obtain necessary permits from the Department of Forest, Resources and Lands, and comply with the Forest Travel Act as decreed and as amended.

Contractor shall take all precautions necessary to prevent fire hazards when working at the Jobsite and shall keep the Jobsite free of all flammable waste. Contractor shall have available, in proper operating condition, sufficient fire fighting equipment, as recommended by the Department of Forest, Resources and Lands, to suit its labour force and Construction Plant. Such equipment shall comply with the standards of, and have approvals of, Underwriters Laboratories of Canada Limited and shall be maintained in accordance with National Fire Protection Association Codes. Contractor shall ensure its personnel are trained in the use of such equipment.

SECTION 3

SPECIAL PROTECTION MEASURES FOR CONSTRUCTION

3.1 Watercourse Crossings

Watercourses are defined as those appearing on 1:50,000 scale topographical maps. All watercourses are shown on Drawing No. B1-250-T-6, sheets 1 to 9 and Drawing No. B1-255-T-04, sheets 1 to 3.

(a) The Contractor shall note that fording of all streams will be permitted, subject to 3.1(b) with the exception of the following:

- (i) Top Pond Brook located at km 11.4;
- (ii) Peter Stride's River located at km 42.5;
- (iii) Tributary of Victoria River located at km 45.6;
- (iv) Lloyd's River located at km 63;
- (v) Tributary of Southwest Brook located at km 73.1;
- (vi) Tributary of Southwest Brook located at km 90.3;
and
- (vii) Southwest Brook River located at km 98.4.

No equipment activity will be permitted in the beds or banks of these watercourses. Access to either side of the above streams is shown in Drawing No. B1-250-T-6, sheets 1 to 9.

(b) When fording any watercourse, the Contractor shall adhere to the following conditions:

- (i) unless otherwise approved by Owner, crossings shall be located within the right-of-way; to obtain approval for a crossing site outside the right-of-way, Contractor shall bring such a proposal to the attention of Owner a minimum of five working days in advance of any anticipated activity in the area;
- (ii) restrict crossings to a single location and cross at right angles to the watercourse;
- (iii) minimize equipment activity within the watercourse by minimizing the number of crossings;

- (iv) ensure that all equipment is mechanically sound to avoid leaks of oil, gasoline, and hydraulic fluids;
 - (v) ensure that no servicing or washing of heavy equipment occurs adjacent to watercourses; fueling, servicing or washing of equipment shall not be allowed within 30 m of a watercourse except within a refueling site approved by Owner where conditions will allow for containment of accidentally spilled fuels; remove from the work area and properly dispose of all waste oil, filters, containers or other such debris in an approved waste disposal site;
 - (vi) stabilize the entire ford area with coarse material (125 mm diameter or greater) when such material is available from a reasonably close location within the right-of-way and the ford area is not natural bedrock, or is easily disturbed by fording; when the substrate of the ford area is not subject to easy disturbance by fording, or coarse material is not easily available within the right-of-way, fording under existing substrate conditions may occur under the direction of Owner;
 - (vii) ensure that fording activities shall not decrease the depth of the watercourse to less than 20 cm; where the existing depth is less than 20 cm, that depth shall be maintained;
 - (viii) ensure that fording activities are halted during high flow periods; and
 - (ix) stabilize all bank sections which contain loose or eroding materials; if banks must be sloped for stabilization, no material shall be deposited within the watercourse; sloping shall be accomplished by back-blading and the material removed shall be deposited above the high water mark of the watercourse.
- (c) Fording of four major watercourses crossed by TL 255 will be restricted to particular locations chosen in advance by the Owner and identified on Drawing No. B1-255-T-04 Sheets 1 to 3. These are as follows:

- (i) a fording site is identified for Grandy Brook at a small bend in the Brook in an area of cobble and boulder substrate with gently sloping banks which are vegetated by black spruce;
 - (ii) a fording site is identified on the east branch of Northwest Arm Brook approximately 100 m north of the transmission line centerline; the banks at this fording site are gently sloping with black spruce cover, and the substrate is boulder and bedrock;
 - (iii) a fording site is identified on the west branch of Northwest Arm Brook approximately 100 m south of the transmission line centerline; the site is in a narrow section of the brook; the banks are gently sloping with black spruce cover, and the substrate is boulder and bedrock; and
 - (iv) a fording site is identified on Couteau Brook across the north end of an island in the brook south of the right-of-way; care must be taken not to disturb a grassy area of the river bank between the fording site and the transmission line center line; banks of the fording site are gently sloping with black spruce cover and the substrate is cobble and boulder.
- (d) At all watercourse crossings, a natural vegetation buffer will be flagged on both banks by Owner (yellow tape). Cutting within the buffer area will be limited to a 3 m wide cleared travel route and selective cutting as identified in the field by the Owner. Equipment activity will be restricted to the 3 m wide travel route. All slash will be removed and piled in the adjacent right-of-way above the high water mark.

3.2 ACCESS TO SITE

- (a) There will be no special access provided to the Jobsite other than the existing roads.
- (b) The number of access routes to be used between the Burgeo Road (Route 480) and the transmission line right-of-way will be limited. Existing access routes shall be used wherever possible. Existing access routes which have been evaluated by Owner and judged to be environmentally acceptable, with some minor precautions and improvements, for use during construction, are identified on Drawing No. B1-250-T-6 sheets 1 to 9. The Contractor shall use these existing access routes for all required access between the Burgeo Road and the

right-of-way wherever possible. The Contractor shall not develop or use any additional access routes without prior approval of Owner.

Designated access roads shown on Drawings have been approved by Owner for use by Contractor. Contractor shall satisfy itself as to the condition and suitability of these roads.

Contractor shall note that although these routes have been designated for use, certain precautionary measures are required as detailed below:

- (i) at the km 42.4 access point, travel over the undeveloped land between the end of the existing road and the right-of-way shall not occur within 50 m of the adjacent watercourse in order to minimize disturbance to sensitive bogs;
 - (ii) at the km 42.6 access point, travel over the undeveloped land shall not occur within 50 m of the adjacent watercourse in order to minimize disturbance to its bank;
 - (iii) at km 54.3, contractor shall obtain permission from the owner of the access road before using it.
 - (iv) at km 81, Contractor shall exercise care to minimize disturbance in steeply sloping sections of the access road where existing erosion is evident.
 - (v) at km 85.3, access is possible directly from the Burgeo Road; a natural vegetation buffer shall be maintained within the right-of-way at this road crossing site; clearing within this buffer shall be limited to that required for equipment access or as otherwise directed in the field by Owner; equipment must not travel outside the cleared travel route within this buffer; and
 - (vi) at km 116.6, a beaver has constructed a dam across the access road where the right-of-way crosses it; care must be taken to avoid damage to the beaver dam; equipment can be diverted around the dam on its east side to obtain access to the right-of-way.
- (c) To obtain approval for additional or new access routes, Contractor shall bring such proposed routes to the attention of Owner a minimum of five working days in advance of any anticipated activity in the area. Owner

will ensure that the proposed access route is inspected to determine if it is environmentally acceptable. The route will be marked in an agreed manner, such as flagging with surveyor's tape, in advance of construction. Owner may reject the use of the proposed access route if there is alternative existing access within a reasonable distance, or if there is a potential alternative access route which is less environmentally sensitive within a reasonable distance. Environmental sensitivity in this instance includes watercourses, bogs, areas of potential slope instability and erodable soil.

In certain specific areas where access points may be required by the Contractor no access roads are existing at present. Owner has identified potential access routes for contractor. These are shown on Drawing No. B1-250-T-6 sheets 4 and 9. These potential access routes are:

- (i) at a point located approximately east of km 44.8, access from the Burgeo Road to the right-of-way may begin at the base of a low hill on the south side of a 100 m wide bog as identified on Drawing No. B1-250-T-6 sheet 4 of 9; a 5 m minimum natural vegetation buffer shall be left between the access point and the bog;
- (ii) at a point located approximately east of km 45.7, as identified on Drawing No. B1-250-T-6 sheet 4 of 9; a 50 m minimum natural vegetation buffer shall be left between the stream to the south and the access route; the access right-of-way should commence at a 45° angle to the Burgeo Road and then curve in the opposite direction to form an "S" shape; this is to minimize access visibility from the road;
- (iii) at a point located approximately east of km 47.3, as identified on Drawing No. B1-250-T-6 sheet 4 of 9; vehicle movement between the Burgeo Road and the right-of-way shall be restricted to stable shrub covered ground wherever possible, bog areas should be avoided;
- (iv) at a point located approximately east of km 50.5, as identified on Drawing No. B1-250-T-6 sheet 4 of 9; vehicle movement between the Burgeo Road and the right-of-way shall be restricted to stable shrub covered ground wherever possible, bog areas should be avoided; and

- (v) at a point located approximately east of km 107.6; as identified on Drawing B1-250-T-6 sheet 9 of 9; the access right-of-way shall commence at a 45° angle to the Burgeo Road and then curve in the opposite direction to form an "S" shape to minimize access visibility from the road.
- (d) Clearing for the above access routes shall be limited to a 3 m wide right-of-way except where equipment requires a wider right-of-way. Chain-saws or other hand-held equipment shall be used in clearing except where alternative methods or equipment are approved by Owner.
- (e) No access routes have been identified between km 0 and km 23 of TL 250. Access routes will be permitted at approximately 3 km intervals. Access routes must be approved in advance by Owner. Access routes should take advantage of terrain features to hide the access from view from the Burgeo Road as much as possible.

.3 OFF RIGHT-OF-WAY TRAVEL

Contractor shall limit equipment travel to the surveyed right-of-way. To obtain approval for additional or new travel routes, contractor shall notify Owner a minimum of five working days in advance of such requirements.

.4 SENSITIVE AREAS

- (a) The potential for large scale erosion as a result of vehicle activity has been identified in some steeply sloping terrain sections traversed by the right-of-way. This is especially apparent in some recently logged areas where erosion has already occurred along access roads and skidder trails and, in some cases, is still occurring. The areas of concern have been identified on Drawing No. B1-250-T-6 sheets 6 of 9, and 8 of 9. These areas are between:

- (i) km 73.8 and km 80.5 of TL 250;
- (ii) km 82.0 and km 83.0 of TL 250;
- (iii) km 91.8 and km 95.9 of TL 250; and
- (iv) km 100 and km 105 of TL 250.

Vehicular activity in these areas shall be minimized and restricted to one track within the right-of-way unless otherwise approved or directed by Owner. Vehicular activity in these areas shall conform with

good construction practices.

- (b) Particular travel routes have been chosen by Owner for certain sensitive terrain areas associated with major watercourse crossings for TL 255. The following sensitive terrain areas and travel routes are identified on Drawing No. B1-255-T-04 sheets 1 of 3 and 3 of 3:
 - (i) travel in the sensitive terrain area on east side of Grandy Brook shall not parallel the drainage pattern, but rather shall be winding or S shaped to minimize erosion potential;
 - (ii) a travel route is identified across a 100 m bog on the west side of Grandy Brook; the travel route ascending the slope directly west of this bog must avoid runoff gullies paralleling the slope; and
 - (iii) a travel route is identified through a section of black spruce shrub across a bog on the west side of Couteau Brook.
- (c) All bogs are considered sensitive terrain because of their high disturbance potential. Travel across bogs should be avoided wherever possible.

Essential vehicular activity on bogs shall be minimized and restricted to one track within the right-of-way unless otherwise approved and directed by Owner. Essential vehicular activity on bogs shall conform with good construction practices.

Two bogs in particular are identified in which any equipment activity must be approved in advance by Owner. Access is available on both sides of these bogs. These bogs are identified on Drawing No. B1-250-T-6 sheet 5 of 9, and are located:

- (i) at km 55.5 to km 55.8 on TL 250; and
 - (ii) at km 57.5 to 58.3 on TL 250.
- (d) A natural vegetation buffer shall be maintained within the right-of-way at these road crossing sites:
 - (i) at km 86.9 on TL 250; and
 - (ii) at km 120.3 on TL 250.

Clearing within the buffer shall be limited to that required for equipment access or as otherwise directed in the field by Owner; equipment must not travel outside of the cleared travel route within this buffer.

3.5 EROSION CONTROL

- (a) Contractor shall minimize terrain disturbance and erosion resulting from its activities. Contractor shall, as part on its Work, implement erosion control measures where its activities result in the blockage of natural drainage, the diversion of natural drainage, or the exposure of soil or subsoil to potential erosion. Particular erosion control measures may include:
 - (i) spreading a thin layer of brush or slash over disturbed areas;
 - (ii) the installation of baffles or sediment traps at appropriate intervals within the area of disturbance;
 - (iii) the installation of drainage collectors across the disturbed area to channel drainage into vegetated areas;
 - (iv) the re-routing of disturbed drainage into its natural course; and
 - (v) the stabilization of exposed soils with appropriate rip-rap.

3.6 CLEARING AND TIMBER SALVAGE

- (a) Clearing for the transmission line and for any other areas as designated by Owner shall consist of the cutting and piling of all trees, brush, fallen timber, stumps and debris, and the removal, transportation and stockpiling of salvaged timber.
- (b) All material shall be cut to within 150 mm of the surface of the ground. In the case of large trees with protruding roots, this distance may be increased to suit conditions as directed by Owner. All trees and brush shall be cut into lengths to ensure neat piling can be accomplished. No brush pile shall be higher than three metres and tree trunks are to be laid at right angles to the right-of-way centerline.

- (c) The right-of-way shall be cleared generally to widths as shown on Drawing No.B1-250-T-6, sheets 1 to 9 and in detail as indicated on centerline staking provided by Owner. In areas where steep sidehills exist, the cleared width shall be modified as specified by Owner.
- (d) Slash shall be piled so that it will not damage vegetation outside the right-of-way. A 6.5 m break in slash piles will be made at least every 200 m (to allow for lateral drainage and animal access). Slash piles may be placed on alternating sides of the right-of-way.
- (e) Slash and any other construction material or debris shall not be permitted to enter any water body and shall be piled such that seasonal flood waters cannot reach them.
- (f) Chainsaws or other hand held equipment shall be used in clearing vegetation within the right-of-way except where alternative methods or equipment are approved by Owner. The use of mechanical clearing methods, such as bulldozers, will not be approved except in extraordinary cases where the salvage of merchantable timber is not required and where the resulting terrain disturbance will not cause loss of topsoil or erosion problems.
- (g) Cleared material including all salvaged timber, slash, cuttings, brush and debris shall be completely removed from the area within six metres on both sides of the centerline of the proposed transmission line.
- (h) In addition to the above, brush and debris at all angle locations shall be piled outside a radius of 30 metres in any direction from the centerline angle point.
- (i) At watercourses and road crossings the cleared right-of-way shall be approximately three metres wide for a length to be determined in the field by Owner. Restrictions on activity within these buffer zones are detailed in Special Protection Measures 3.1.
- (j) Trees outside the indicated clearing widths which in the opinion of Owner would constitute a hazard to the safety of the proposed transmission line or equipment, and which are so designated by Owner shall be felled, slashed, piled, or removed, as directed by Owner. Contractor shall not remove any trees outside the clearing widths other than those so designated by Owner.

- (k) No salvageable merchantable timber is available on either Crown lands or Corner Brook Pulp and Paper Company lands crossed by the right-of-way.
- (l) Contractor shall note that salvaged timber is the property of Abitibi-Price Inc. when cut on its land.
- (m) All merchantable timber, within areas specified by Owner as salvageable timber areas, shall be salvaged and removed and delivered to a designated landing site at Stephenville. The salvaged wood will be scaled at the landing site. The salvageable timber areas are indicated on Drawing No. B1-250-T-6, sheets 1 to 9.
- (n) Merchantable timber is defined as softwood, i.e. spruce or fir, having a minimum dbh of 100 mm and suitable, in the opinion of Owner, for pulpwood. All merchantable timber shall be cut down to a 75 mm top.
- (o) The pulpwood shall meet Abitibi-Price pulpwood cutting specifications and shall be cut in 2.5 m lengths. Owner shall have the right to determine any other aspect of the manner of cutting, removal and stockpiling of merchantable timber.
- (p) The removal and stockpiling of merchantable timber shall not operate to give Contractor any title to such timber, and it shall not become the property of Contractor. Contractor shall negotiate a price with Abitibi-Price for the salvaged timber delivered to the designated landing site.
- (q) Hardwood and any other non-merchantable timber cut in the area specified to be cleared shall not be the property of Contractor.

3.7 WILDLIFE PROTECTION

- (a) To minimize any disturbance to caribou during the calving period, construction activity, including vehicular movement and the distribution of poles and other material, shall not be permitted between km 21.0 of TL 255 and the Hope Brook Mine during the period from May 15 to June 15, 1987.
- (b) Only essential vehicular activity, including helicopter flights, shall be permitted along the transmission line routes in order to minimize any disturbance of wildlife.

3.8 HISTORIC RESOURCES

- (a) General Protection Measure 2.8 will be applied by Owner to ensure protection of any historic resources which may be identified during construction. Owner will receive instruction from a professional archaeologist in the identification of potential historic resources in the field.

3.9 STATION CONSTRUCTION

- (a) Drainage from the worksite will be controlled during construction of both the Grandy Brook and Hope Brook Stations to minimize the potential for sediment entering adjacent watercourses. This may involve the construction of ditches to direct runoff away from watercourses, and the placement of sediment traps in drainage ditches to remove sediment from the runoff.
- (b) Borrow material for Station construction will be obtained from existing borrow areas wherever possible. Where existing borrow areas are not available General Protection Measure 2.10 will be applied to all new borrow areas.

3.10 DEWATERING

- (a) Water shall be pumped from pole excavations into adjacent vegetated areas where it will be filtered prior to entering a watercourse.

SECTION 4

ENVIRONMENTAL INSPECTION

Environmental compliance monitoring on-site will be the responsibility of the Construction Inspectors and the Environmental Coordinator. Construction Inspectors will ensure implementation of the general and special environmental protection measures which are specified in the clearing and construction contracts. All Construction Inspectors will be instructed on the environment related General, Special, and Technical clauses to be implemented as part of the contracts. Inspectors will also receive instruction from a professional archaeologist on the identification of potential historic resources which may be encountered in the work area.

The Environmental Coordinator's main responsibilities will be:

- (1) coordinating all environmental activities and decisions to be made by Owner as per this specific EPP, and as outlined in contracts and permits;
- (2) instructing and advising Construction Inspectors on environmental protection measures to be implemented; and
- (3) monitoring Contractors' compliance with contract clauses, permit conditions, and the commitments made in this document and the Environmental Impact Statement.

The Environmental Coordinator, who is experienced in construction methods and equipment as well as construction related environmental protection techniques, will coordinate the implementation of environmental protection measures. The Environmental Coordinator, Mr. David Vokey, is a member of Hydro's Environmental Services Department, and will be assigned to the Jobsite for the duration of construction. Mr. Vokey can be reached at:

Newfoundland and Labrador Hydro
Construction Division
P.O. Box 626
Stephenville
Newfoundland
A2N 3B5
Telephone: 643-9664

SECTION 5

LINE MAINTENANCE

5.1 Access to Site

Ground travel for line maintenance will be restricted to travel routes established during construction. These travel routes will be identified on 1:10,000 scale air photo mosaics of the right-of-way to be provided by Hydro and will be marked in the field in an agreed manner.

5.2 Watercourse Crossings

- (a) All watercourse banks which were sloped and/or stabilized during construction to minimize siltation, will be inspected at the time of line inspections. Any evidence of serious erosion will be noted and reported to Hydro's Environmental Services Department. Any re-sloping or replacement of rip-rap which may be necessary to minimize the introduction of sediment into watercourses will be undertaken by line maintenance personnel immediately or as soon as possible thereafter.
- (b) Fording sites will be maintained to conform to the conditions specified in Special Protection Measure 3.1 (b) and all relevant government permits.

5.3 Erosion Control

- (a) Erosion control mechanisms installed during or after construction will be monitored and maintained as part of line maintenance activities. Any such mechanisms which are found to be ineffective will be repaired or replaced.

5.4 Wildlife Protection

- (a) Personnel shall not feed or harass wildlife.
- (b) Hydro personnel shall not interfere with trap lines or associated equipment.
- (c) Regular maintenance and ground inspection activities for TL 255 will not be scheduled during the period of May 1 to July 31 to avoid disturbance of caribou which aggregate in the area at that time.

Helicopter inspections of the transmission line are scheduled for early to mid-March, early August, mid-September, and early to mid-December.

The winter ground inspection is scheduled for early March, depending upon snow conditions. This schedule may vary somewhat, depending upon caribou activity along the transmission line.

5.5 Vegetation Control

- (a) No herbicide will be applied on TL 255 or on that section of TL 250 south of Peter Strides's River. Vegetation control in those areas will be handled by cutting using chain-saws.
- (b) Elsewhere on TL 250, no herbicide will be applied without prior written approval of the Minister of Environment pursuant to the Pesticide Control Act, 1983 and the Pesticides Control Regulations, 1984.

All herbicide applications will be made by Owner under the supervision of qualified Licensed Applicators as defined in the Pesticides Control Regulations, 1984. There will be no herbicide applications under any of the following conditions:

- (i) within 30 m of the boundary of a municipal, provincial, or national park;
- (ii) on private property, without first obtaining the owner's permission;
- (iii) within 10 m of any body of salt water;
- (iv) where the slope of the right-of-way is less than or equal to 20%, no herbicide will be applied within 25 m of any watercourse; where the slope of the right-of-way is greater than 20%, no pesticide will be applied within 50m of the watercourse;
- (v) within 100 m of any permanent residence without permission of the owner;
- (vi) on any vegetation which is more than 1 m in height and which is within view of a public highway.

5.6 Station Maintenance

- (a) Owner shall develop and maintain an oil spill contingency plan for the stations associated with this project. Sheets listing procedures to be followed in the event of an oil spill, including reporting procedures, will be posted in a prominent location at each station.

- (b) Owner shall monitor electrical equipment performance to anticipate any potential failures which could result in a release of insulating oil.

5.7

General Protection Measures for Line Maintenance

In addition to the specific protection measures above, Hydro's operation personnel will adhere to all relevant general protection measures detailed in Section 2 of this document.

SECTION 6

PERMITS

Permits for fording watercourses on TL 250 have been obtained from Fisheries and Oceans Canada, and the Provincial Department of Environment. These are included on the following pages. The borrow pit permit from the Department of Mines and Energy has not yet been received.



Fisheries and Oceans
Pêches et Océans

250-1100.

Application No. N° de la demande	OCT 2 - 1985
Authorization No. N° de l'autorisation	2-378

AUTHORIZATION FOR WORKS OR UNDERTAKINGS AFFECTING FISH HABITAT
AUTORISATION POUR TRAVAUX OU OUVRAGES MODIFIANT L'HABITAT DU POISSON

Authorization issued to Autorisation délivrée à	Mr. Jeffrey Barnes, Newfoundland Hydro, Environmental Services Department P.O. Box 9100, Station B, St. John's, NF A1A 2X8					
Location of Project Emplacement du projet						
Valid Authorization Period Période de validité	From De	D/J 30	M/M 09	Y/A 86	To À	D/J M/M Y/A N/A
Description of Works or Undertakings Description des travaux ou des ouvrages	Watercourse crossings and related activities in association with the Bottom Brook to Grandy Brook Transmission Line (TL250)					
Conditions of Authorization Conditions de l'autorisation	1. The contractor will not be authorized to ford with any piece of equipment or carry out any instream activity in the following watercourses (as outlined in Section 3.1 of TL 250) without the express written consent of the Department of Fisheries and Oceans: i) Top Pond Brook located at km 11.4; ii) Peter Stride's River located at km 42.5; iii) Tributary of Victoria River located at km 45.6; iv) Lloyd's River located at km 63; v) Tributary of Southwest Brook located at km 73.1; vi) Tributary of Southwest Brook located at km 90.3; and vii) Southwest Brook River located at km 98.4. 2. No stream fording will be permitted within aquatic habitats with the potential to support Atlantic Salmon spawning. For the purposes of this application, such stream reaches would constitute any stream substrate comprised of coarse gravel 2-8 cm in diameter where water velocities flow rapidly (30-60 cm/sec.)					
The holder of this authorization may undertake only those works or undertakings described above. All conditions set out by the Department of Fisheries and Oceans must be adhered to.	Le détenteur de cette autorisation n'entreprendra que les travaux ou les ouvrages décrits ci-dessus. Toutes les conditions établies par le ministère des Pêches et des Océans doivent être observées.					
The authorization form must be held on site and work crews should be made familiar with conditions noted above.	La formule d'autorisation doit être gardée sur place et les équipes de travail doivent être mises au courant des conditions susmentionnées.					
This authorization is from a Federal Fisheries standpoint only and does not release the holder from its obligation to obtain appropriate approvals from other concerned Federal, Provincial or Municipal Agencies.	La présente autorisation provient du ministère fédéral des Pêches seulement et ne relève pas le détenteur de ses obligations d'obtenir les approbations nécessaires d'autres organismes fédéraux, provinciaux ou municipaux concernés.					
Date of Issuance Date de délivrance	September 30, 1986					
Approved by Approuvé par	O.S. Brenton 					

FP-1544

White - Applicant
Blanc - Requérant

Yellow - District Office
Jaune - Bureau de district

Pink - Regional Office
Rose - Bureau régional

Goldenrod - Field Office
Verge d'or - Bureau de chantier

Canada

DFO Habitat Authorization. 2-378 - Newfoundland Hydro Transmission Line TL250-
Bottom Brook to Grandy Brook.

3. Where fording areas require improvement or stabilization in the estimation of Newfoundland Hydro or its contractors by the placement of coarse material (12.7 cm diameter or greater crushed stone) all such materials must be removed from within the high water marks of the river upon completion of the last required fording.
4. All approach slopes to watercourse fording sites must be stabilized in an effective manner such that sedimentation is not imparted to a watercourse in excess of that outlined in the province of Newfoundland and Labrador Environmental Control (Water and Sewage) Regulations (1980), which state that suspended solids loading to a watercourse should not exceed 30 mg/l above background levels of T.S.S. in that watercourse.
5. Fording of all fish bearing watercourses must be conducted at preselected locations within a 3-meter wide corridor which has been previously identified to the contractor and his equipment operator and is well marked by flagging tape or spray paint in the field, as outlined in Section 3.1(d) of the site specific environmental protection plan.
6. No riparian lands adjacent to any stream shall be disturbed other than those within the approved crossing corridor as outlined in point No. 5.
7. All disturbed riparian lands which pose a potential for erosion and subsequent sedimentation to aquatic environments must be re-stabilized prior to project abandonment.
8. All stream fording activities at sites with erosion potential must be halted during periods of excessive precipitation (in excess of forecasted rains of greater than 25 mm in 24 hours).
9. All equipment used by a contractor to ford any watercourse must be mechanically sound and shall be without any leaks of gasoline, oils or hydraulic fluids. Such equipment must be inspected for compliance with this condition prior to fording any watercourse.
10. Unless there is sound environmental reasons for doing otherwise, fording of heavy equipment should take the shortest and most direct route across any watercourse and only at such times when water levels ensure safe and effective passage of such vehicles across the stream or river.
11. Fueling of contractors vehicles must take place only at designated fueling sites which must not be located within 30 meters of the high water mark of any stream, pond or river.
12. No hydrocarbon containers such as lube cans will be permitted to be washed out in any watercourse or water body.
13. No heavy equipment maintenance is to take place within 30 meters of any water body or watercourse.

DFO Habitat Authorization 2-378 - Newfoundland Hydro Transmission Line TL250-
Bottom Brook to Grandy Brook.

14. No aggregate materials shall be removed for any purpose within the active floodplain of any watercourse (other than those actions necessary to comply with the removal of stream fording improvement materials as outlined in point No. 3.)
15. The appropriate Area Office of DFO Resource Management Branch must be notified 24 hours in advance of a contractor starting to work within the Area Office management boundaries, as shown on the attached map.

cc J. Marshall
A. Pittman
P. LeBlanc

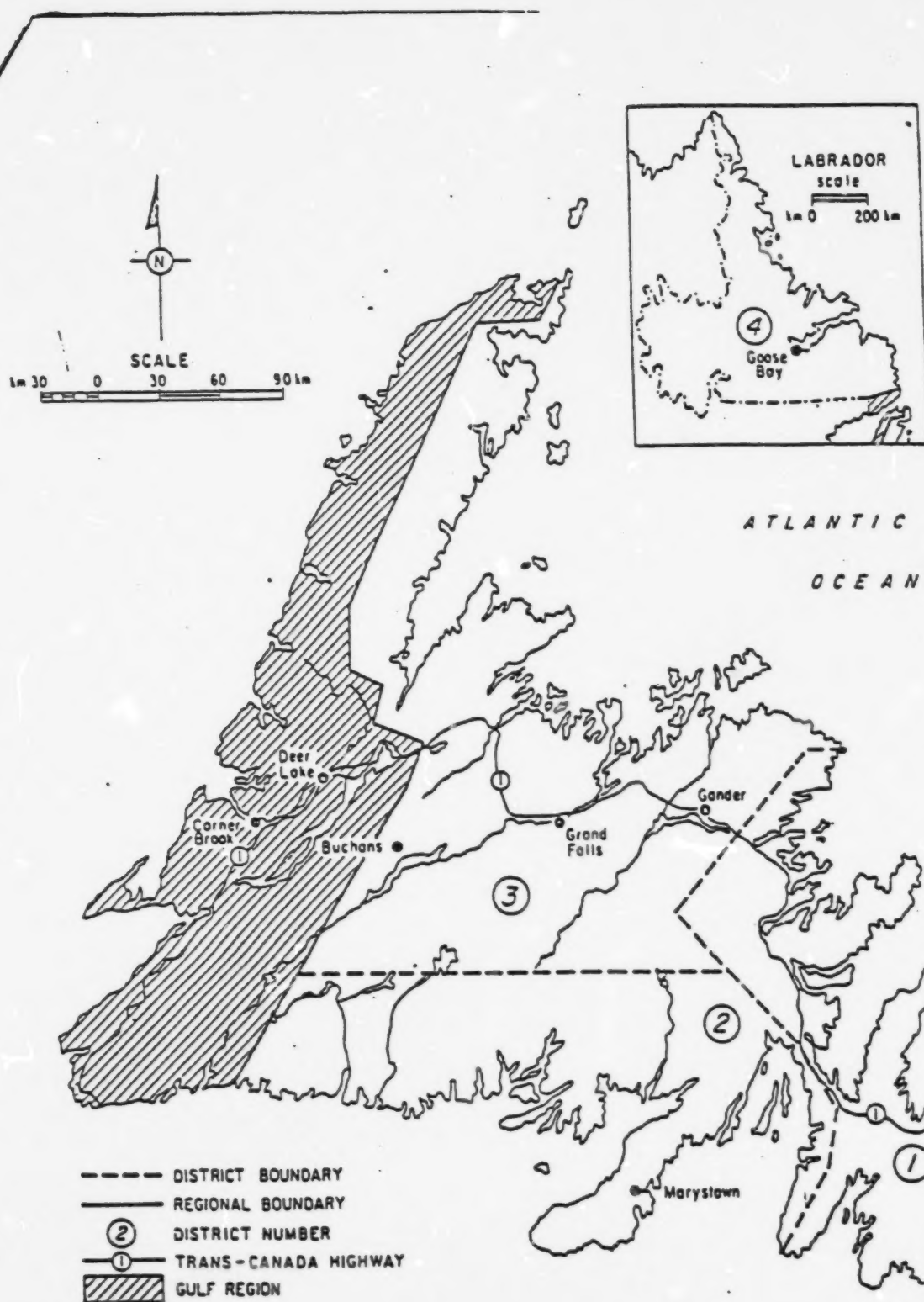


Fig. 28. Boundaries of DFO management areas - Newfoundland Region.

APPENDIX II

Depicted herein are the application and authorization forms for works or undertakings which may affect fish and fish habitat. These forms are available from the following DFQ Offices in Newfoundland and Labrador (see Fig. 28 for District and Regional Boundaries).

Newfoundland Region

District 1

Area Manager
Department of Fisheries and Oceans
P.O. Box 970
St. John's, Newfoundland
A1C 5M3

Phone: 772-5046

District 3

Area Manager
Department of Fisheries and Oceans
P.O. Box 459
Grand Falls, Newfoundland
A2A 2J8

Phone: 489-5601

Gulf Region

Area Director
Department of Fisheries and Oceans
Herald Towers, 6th Floor
Box 2009
Corner Brook, Newfoundland
A2H 6Z6

Phone: 637-4317

District 2

Area Manager
Department of Fisheries and Oceans
P.O. Box 580
Grand Bank, Newfoundland
A0E 2M0

Phone: 832-1491

District 4

District Protection Officer
Department of Fisheries and Oceans
P.O. Box 7003, Station "A"
Goose Bay, Labrador
A0P 1S0

Phone: 896-3263



GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF ENVIRONMENT

CERTIFICATE OF APPROVAL

Pursuant to *The Department of Environment Act*, Section(s) 26

Date 1986 10 01 Approval No. C.A. 86-10-697

Proponent: Newfoundland & Labrador Hydro
Environmental Services Department
P.O. Box 9100
St. John's, Nfld.
A1A 2X8

Attention: Mr. Jeffery L. Barnes, M.Sc.
Senior Ecologist, Monitoring

Re: Stream Fording at various locations along the
Grandy Brook to Bottom Brook Transmission Line (TL 250).

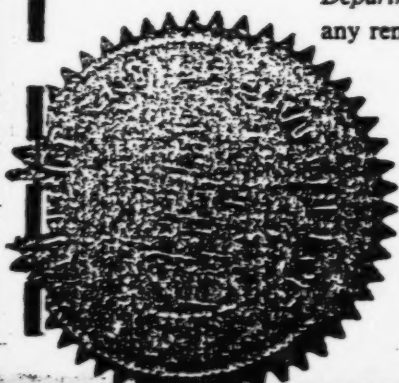
Approval is hereby given for: stream fording at 34 sites along the Grandy Brook to Bottom Brook Transmission Line (TL 250) as indicated in Table 1 and sheet 1-9 of the Environmental Protection Plans Maps and in reference to the application dated September 2, 1986.

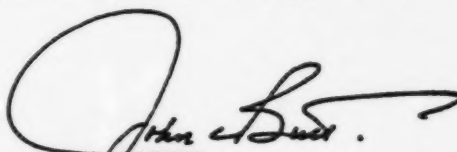
This approval does not release the proponent from the obligation to obtain appropriate approvals from other concerned provincial, federal and municipal agencies.

This approval is subject to the terms and conditions indicated in Appendix A (attached).

It should be noted that prior approval of any significant change in the design or installation of the proposed works must be obtained from the Department of Environment.

Failure to comply with the terms and conditions will render this approval null and void, place the proponent and their agent(s) in violation of *The Department of Environment Act* and make the proponent responsible for taking any remedial measures as may be prescribed by this Department.




MINISTER

APPENDIX A

Approval No. C.A. 86-10-697**Terms and Conditions for Environmental Approval**

- (1) Fording must be confined to one specific location. The fording site chosen for the crossings should be least vulnerable to disruption to land, vegetation and physical features of the channel. The site should be located at a narrow section of the channel with stable bed and low banks of stable and non-erodable materials consisting of rock or cobbles.
- (2) Bank sections at the fording site which contain loose or erodable materials shall be adequately stablized before crossing. Also, the graded sections of the banks must be adequately protected to minimize erosion and siltation of the stream. The grading of the banks should not cause any infilling of the channel.
- (3) If in-stream rock placement is required for this fording site, it should not constrict flow in the river to cause flooding conditions upstream. The material used should be clean blasted rock free of fines and shall be completely removed from the channel when the fording site is no longer required.
- (4) All vehicles using the crossing must be kept reasonably clean and free of mud to prevent siltation or water quality deterioration. The vehicles should also be maintained in good repair, free of oil or other deleterious substances which could impair water quality.
- (5) Fording shall be carried out in such a manner as to cause the least amount of disturbance of channel bed and bank material which could cause erosion, siltation and pollution of down-stream areas. For the same reasons, fording shall be carried out only during low flows.
- (6) When the fording site is no longer required, all constructed works shall be removed so as to discourage illegal fording. The fording site must be brought back to its original condition.
- (7) A completion report must be submitted indicating that the work has been carried out in strict compliance with the terms and conditions of this approval.

Table 1

Stream Fording Site

Bottom Brook to Grandy Brook Transmission Line (TL 250)

Distance From Grandy Brook to Fording Sites (km)	Corresponding Environmental Protection Plan Map (Sheet No.)
5.1	Sheet 1 of 9
8.95	Sheet 2 of 9
17.97	Sheet 2 of 9
21.23	Sheet 2 of 9
21.67	Sheet 2 of 9
22.23	Sheet 2 of 9
22.30	Sheet 3 of 9
25.70	Sheet 3 of 9
29.75	Sheet 3 of 9
31.25	Sheet 3 of 9
33.35	Sheet 3 of 9
35.28	Sheet 3 of 9
35.60	Sheet 3 of 9
36.33	Sheet 3 of 9
41.20	Sheet 4 of 9
48.53	Sheet 4 of 9
52.60	Sheet 5 of 9
60.14	Sheet 5 of 9
65.85	Sheet 6 of 9
69.15	Sheet 6 of 9
75.35	Sheet 6 of 9
78.50	Sheet 6 of 9
79.50	Sheet 7 of 9
81.08	Sheet 7 of 9
83.75	Sheet 7 of 9
85.63	Sheet 7 of 9
86.05	Sheet 7 of 9
86.75	Sheet 7 of 9
95.60	Sheet 8 of 9
102.17	Sheet 8 of 9
107.26	Sheet 9 of 9
108.85	Sheet 9 of 9
109.35	Sheet 9 of 9
112.20	Sheet 9 of 9

- cc: Dr. Wasi Ullah (2 copies)
Director
Water Resources Division
Department of Environment
Confederation Building
St. John's, Nfld.
A1C 5T7
- cc: Mr. G. W. Freake
Licensing and Enforcement Supervisor
Department of Environment
Confederation Building
St. John's, Nfld.
A1C 5T7
- cc: Mr. Calvin Mitchell, M.H.A.
LaPoile District
c/o House of Assembly
Confederation Building
St. John's, Nfld.
A1C 5T7

APPENDIX III

INFORMATION PACKAGE DISTRIBUTED

AT PUBLIC INFORMATION MEETINGS

IN GRAND BRUIT AND BURGEON

AUGUST 7, 1986

PUBLIC INFORMATION MEETING
CONCERNING

THE PROPOSED 138 KV TRANSMISSION LINE FROM
GRANDY BROOK STATION TO THE HOPE BROOK MINE

GRAND BRUIT/BURGEO AUGUST 7, 1986

PROPONENT: NEWFOUNDLAND AND LABRADOR HYDRO

INTRODUCTION

Newfoundland and Labrador Hydro (Hydro) proposed to construct a transmission line from the existing Bottom Brook Substation to Burgeo and the proposed Hope Brook Gold Mine. This proposed undertaking was registered under the Environmental Assessment Act on January 15, 1986. Subsequently, the Minister of Environment required that Hydro prepare an environmental impact statement (EIS) on that portion of the proposed transmission line between a station to be constructed near the Burgeo Road (Grandy Brook Station) and the Hope Brook Mine. The remainder of the proposed route did not require an EIS.

Under the Environmental Assessment Act, the proponent of a proposed undertaking is required, during an environmental assessment, to meet with interested members of the public, especially those close to the geographical area of the undertaking. The objectives of the Public Information Meeting are:

- (1) to fully describe the proposed transmission line and its potential environmental impacts; and
- (2) to record any concerns that may be expressed by the residents of Grand Bruit and Burgeo regarding potential environmental impacts of the proposed transmission line. Concerns that are expressed by residents will be recorded and addressed in the EIS.

PROJECT DESCRIPTION

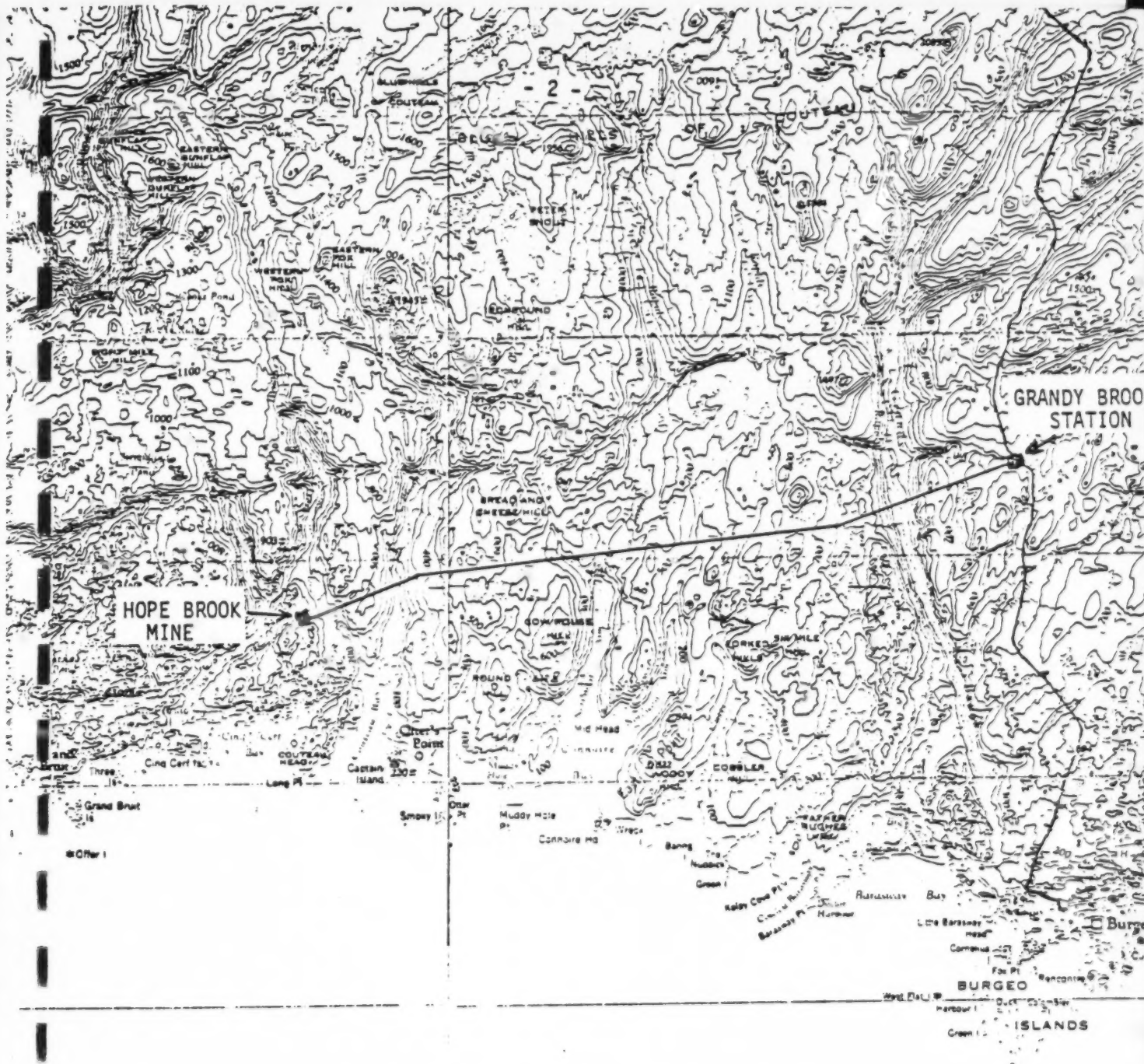
1. Geographic Location

In order to connect the proposed Hope Brook Mine to the provincial electric grid, the Grandy Brook Station will be constructed approximately 24 km north of Burgeo. The proposed route of the 138 KV transmission line runs approximately 33 km in a westerly direction from Grandy Brook Station and terminates at a substation to be built near the Mine (see Figure 1).

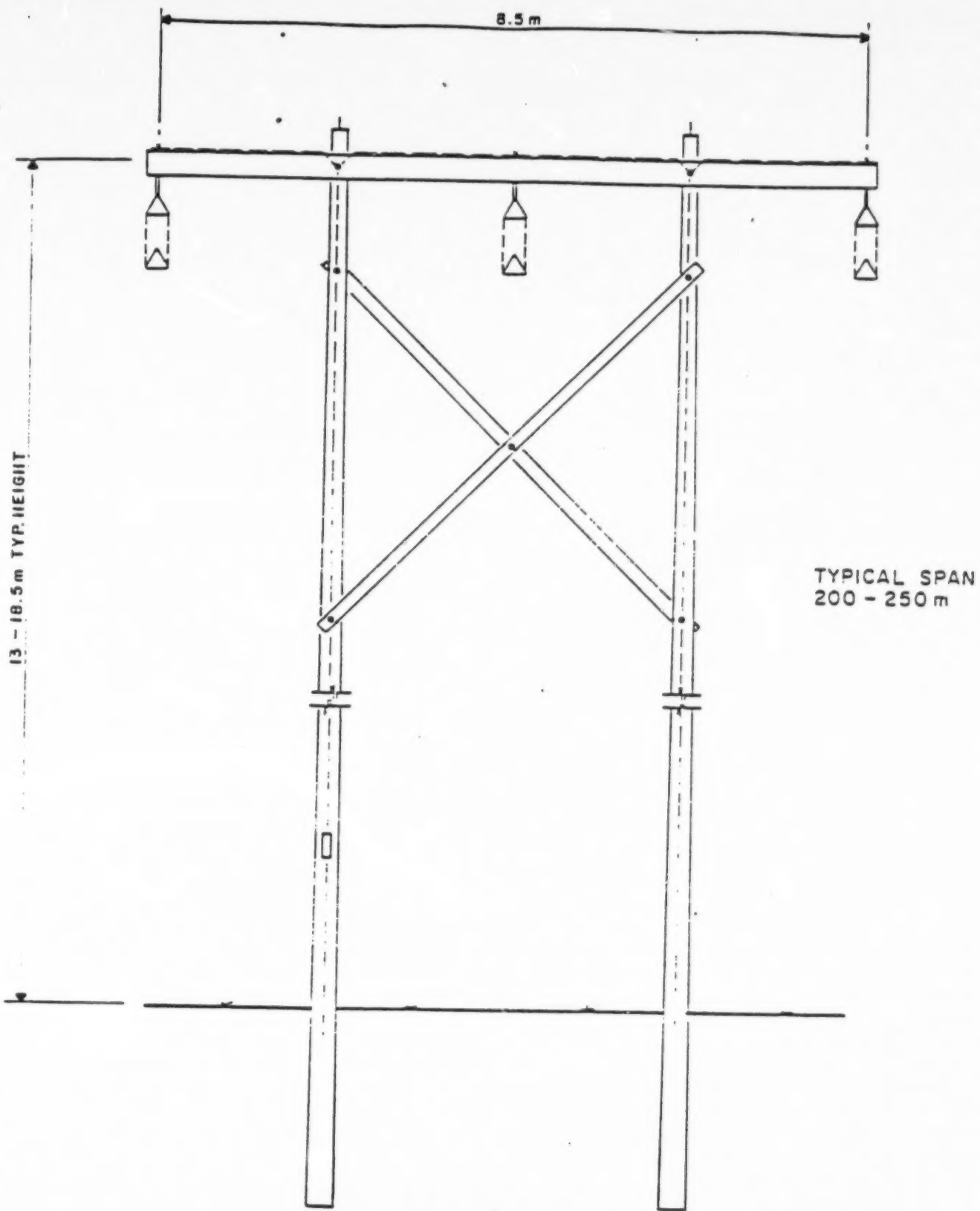
2. Physical Features

(a) Transmission Line

The proposed 138 KV overhead transmission line will be an H-Frame wood pole structure (Figure 2). The width of the right-of-way will be approximately 30 m.



PROPOSED GRANDY BROOK STATION TO
HOPE BROOK MINE TRANSMISSION LINE
FIGURE 1



TYPICAL TANGENT STRUCTURE

138 kV TRANSMISSION LINE

FIGURE 2

(b) Substations

The Grandy Brook Station and the Substation at the Mine will incorporate conventional switchgear. These sites will be cleared, graded to required elevations, fenced, and concrete footings poured for major equipment. All dielectric fluids used in substation equipment will conform with industry and government standards and regulations.

3. Construction

In order to meet the required in service date of 31 December 1987, Hydro expects to survey the proposed route in the fall of 1986. Construction of the line will require approximately seven months (June to December 1987). Construction of civil works associated with the substations is scheduled to commence in May 1987.

ENVIRONMENTAL CONCERNS

The following environmental concerns were identified during a review of Hydro's registration document by the public and government agencies:

- (1) potential adverse impacts on historic resources such as sites used by Beothuk, Micmac, Little Passage Indians and Dorset Eskimo;
- (2) potential adverse impacts on water quality and fish habitat at stream crossings;
- (3) potential adverse impacts on raptors (e.g., eagles, ospreys) and the LaPoile caribou herd.

Hydro has responded to these concerns and they will be fully addressed in the EIS. Studies by consultants, conducted in 1986, have indicated that the potential for adverse impacts on historic resources and raptors are minimal.

A consultant was commissioned to examine the ecological risk to the LaPoile caribou herd of constructing the proposed transmission line. The results of this study and further discussions with the Wildlife Division will clarify the need for monitoring studies.

It is Hydro's experience that, given proper planning, transmission lines can be designed, constructed and operated in an environmentally acceptable fashion. In particular, such construction related environmental impacts as terrain erosion and siltation of water courses can be minimized or avoided by good planning and construction techniques. Hydro is preparing an environmental protection plan which, along with environmental compliance monitoring, will minimize any adverse impacts on sensitive wildlife species and aquatic and terrestrial habitats.

APPENDIX IV

NOTES FROM THE

PUBLIC INFORMATION MEETINGS

IN GRAND BRUIT AND BURGEON

GRAND BRUIT

The following issues were addressed in Grand Bruit.

1. In order to minimize the impact on caribou, would Hydro actually halt construction of the line for a period of time?

Hydro indicated that this mitigation measure was employed during construction of the Upper Salmon Hydro-electric Development, and would be considered for the present undertaking.

2. Will a transmission line be constructed from the Hope Brook Mine Station to Grand Bruit?

Hydro replied that this issue is presently under study. If the study indicates that it is feasible to connect Grand Bruit to the provincial electric grid, then that recommendation will be made.

BURGEO

The following issues were discussed in Burgeo:

1. Will the diesel generating plant be left in Burgeo as a backup in case of problems with the transmission line? Concern was expressed regarding power outages, particularly during the winter.

It was explained that following construction of a transmission line, it is Hydro's policy to maintain the capability for diesel generation in a community for one winter in case operating problems arise. Following that period, the diesel units are removed if they are required elsewhere, and the community is provided with the same service as other customers connected to the grid. In Burgeo, the capability for diesel generation will be phased out in April 1988.

2. Will the Hope Brook Mine have backup diesel generation capability?

Yes, but it will be provided by Hope Brook Gold Inc., rather than Hydro.

3. How long will it take to build the line from Grandy Brook Station to the Hope Brook Mine Station?

Construction will require approximately seven months.

4. Will the lack of an access road along the proposed transmission line slow repairs, particularly during the winter?

Lack of an access road can increase the time required to complete repairs on a line. However, the proposed line will be designed and constructed so as to minimize the probability of failure.

5. Why are wood poles being used, rather than steel structures?

Wood poles are less expensive than steel structures and they are suitable for environmental conditions in the area.

6. Will much cutting be required to clear the right-of-way?

No, much of the route is located on treeless barrens.

7. Will helicopters be used to erect the poles?

Due to weather conditions, most of the construction will be accomplished using equipment mounted on tracked vehicles.

8. Where does the transmission line to Grandy Brook Station begin?

It will extend from the existing Bottom Brook Station to Grandy Brook Station.

9. Where will the Grandy Brook Station be located?

It will be located on the west side of the Burgeo Road approximately 23 km north of Burgeo near Wooden Tilt Brook.

10. Will it be possible to connect cabins along the Burgeo Road to the transmission line and what will be the cost?

It will not be possible to provide electricity to cabins north of the Grandy Brook Station because the voltage differential is too great. However, cabins south of the station could be connected at a cost which will depend on their location.

11. There was considerable discussion on the relative costs of heating a house with diesel-generated electricity and with power from the grid.

**MAPS
NOT
FILMED**

**CARTES
OMISES**